ROANOKE AGENCY DIAL A RIDE TRANSIT DEVELOPMENT PLAN: FISCAL YEARS 2010 – 2015

Prepared for:

RADAR

Prepared by:

PBS&J®

Under contract to:

DRPT
Virginia Department of Rail and Public Transportation
The Smartest Distance Between Two Points

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[*] *Currently defined as a service that is provided in a rural portion of the Commonwealth, RADAR is not required to prepare and submit its own separate Title VI report or the associated FTA Quadrennial Review; therefore, Appendix A and Appendix B are not included as part of this document.*

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1.0 RADAR SYSTEM OVERVIEW

1.1 History

Unified Human Services Transportation Systems Inc., trading as Roanoke Agency Dial a Ride (RADAR), was formed in 1975 as a not-for-profit community corporation that contracts with area social service agencies, governments, and organizations in the Roanoke Valley Area to provide transportation services.

1.2 Governance

RADAR is overseen by a Board of Directors consisting of four officers (president, vice president, secretary, treasurer) and up to 12 additional board members. Members are appointed by the existing board. There are no term limits for board members. The Executive Director, Curtis Andrews, reports to the board on a bi-monthly basis. The current board members and their terms are presented in **Table 1-1**.

Table 1-1. RADAR Board of Directors

Bruce Hollar - *President*
Sam Long – *Vice President*
Claude Reynolds – *Secretary*
Stebbins Hubard
Arlene Stoller
Thelma Haynesworth
Scott McCoy
Kathy Claytor
Danny Camper
Tim Hager
Samuel Silek, RPh

1.3 Organizational Structure

The day-to-day operations of the system are administered by Curtis Andrews, the transit system manager. Mr. Andrews has served in this position since 1986. An organizational chart for the RADAR Transit system is presented in **Figure 1-1**.

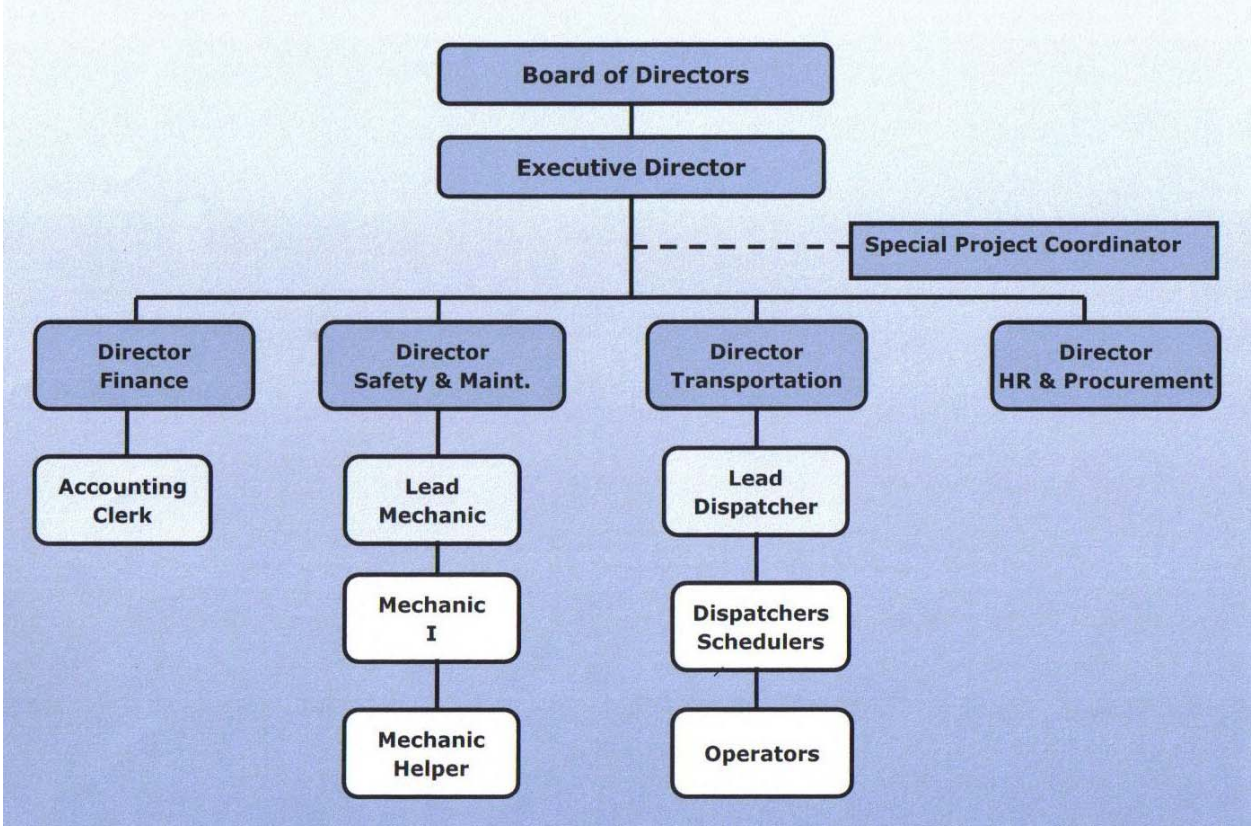


Figure 1-1. RADAR Organizational Chart

Currently, there are 58 drivers employed by RADAR, with an average hourly rate of $8/hour. There are no labor unions or labor contracts. RADAR does not contract out any of its services to other transit operators.

RADAR provided transportation services to over 30 human service agencies, governments, and other private organizations during their last fiscal year. Most of the services were provided at an hourly rate.

1.4 Transit Services Provided and Areas Served

Areas Served. RADAR serves an area of over 1,100 square miles in Roanoke, Alleghany, Franklin, and Henry Counties, as shown in **Figure 1-2**. This area includes the towns of Salem, Roanoke, Vinton, Covington, Boones Mill, Rocky Mount, and Martinsville. The population served in these areas was approximately 335,000 (in 2008).

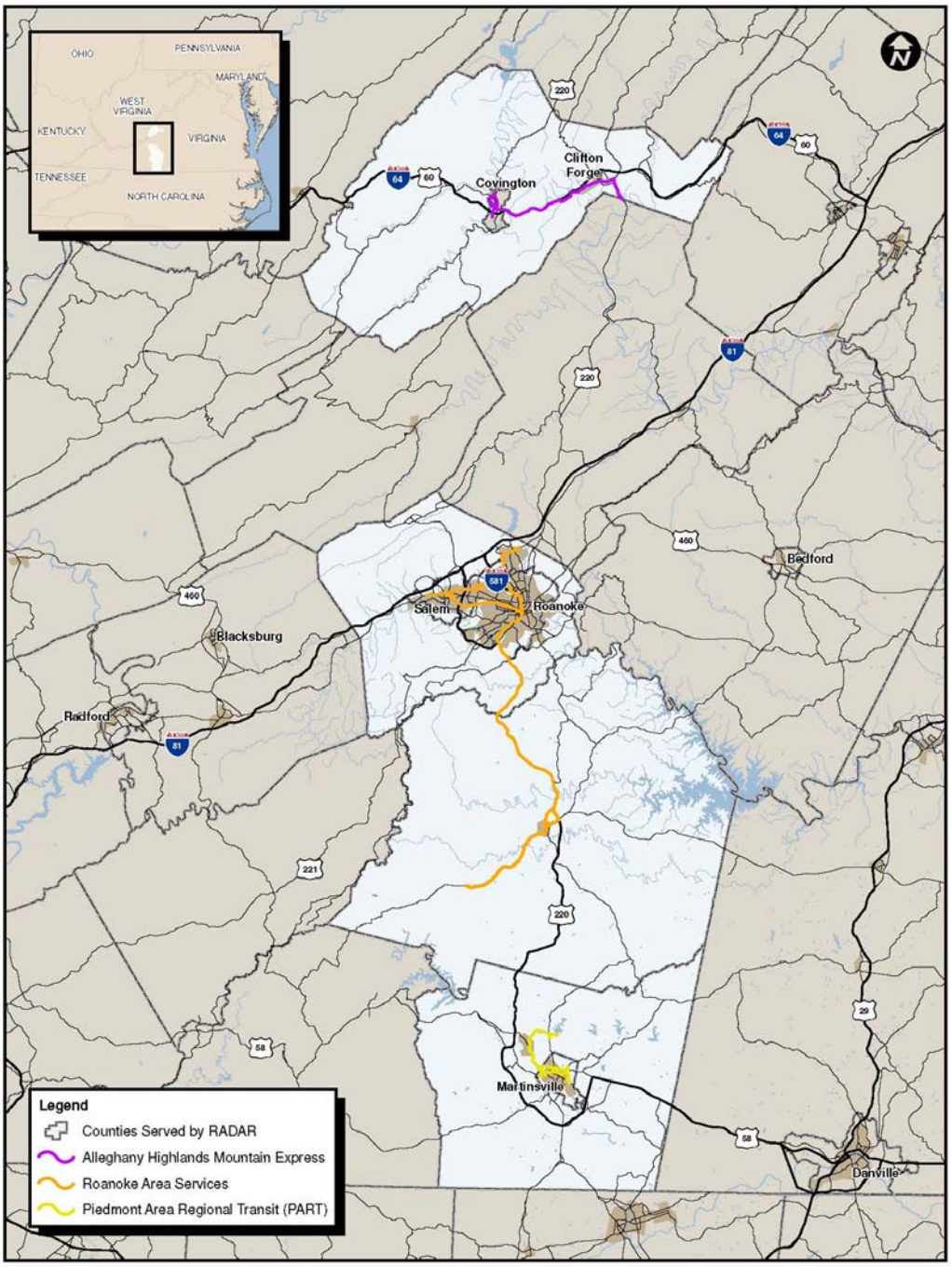


Figure 1-2. Area Served by RADAR

Transit Services Provided. The RADAR Transit system provides bus services via fixed, deviated fixed, and demand-response routes. The system runs three fixed express service routes (Hollins Express, Ferrum Express, and Maroon Route), two deviated fixed routes (Mountain Express, Piedmont Area Regional Transit), and two demand-response services (CORTRAN, STAR). These routes require a maximum of 41 vehicles.

The existing routes are summarized in **Table 1-2** and shown in **Figures 1-3 through 1-5**. Note that no connecting services are provided to other routes.

Table 1-2. Summary of Transit Routes

Route	Service Type	Origin	Destination	Service Area
Hollins Express	Fixed Express	Hollins University	Center in the Square Roanoke	Roanoke County, Roanoke City
Ferrum Express	Fixed Express	Ferrum College	Center in the Square Roanoke	Counties of Franklin & Roanoke
Maroon Route	Fixed Express	Roanoke College	Center in the Square Roanoke	Cities of Salem, & Roanoke
Mountain Express	Deviated Fixed Route	Covington	Iron Gate	Covington – Clifton Forge - Iron Gate
Piedmont Area Regional Transit (PART)	Deviated Fixed Route	1 Route Henry County 1 Route City of Martinsville		Henry County and City of Martinsville
CORTRAN	Demand Response	Call in service	NA	Roanoke County
STAR	Demand Response	Call in service	NA	Cities of Roanoke & Salem. Town of Vinton

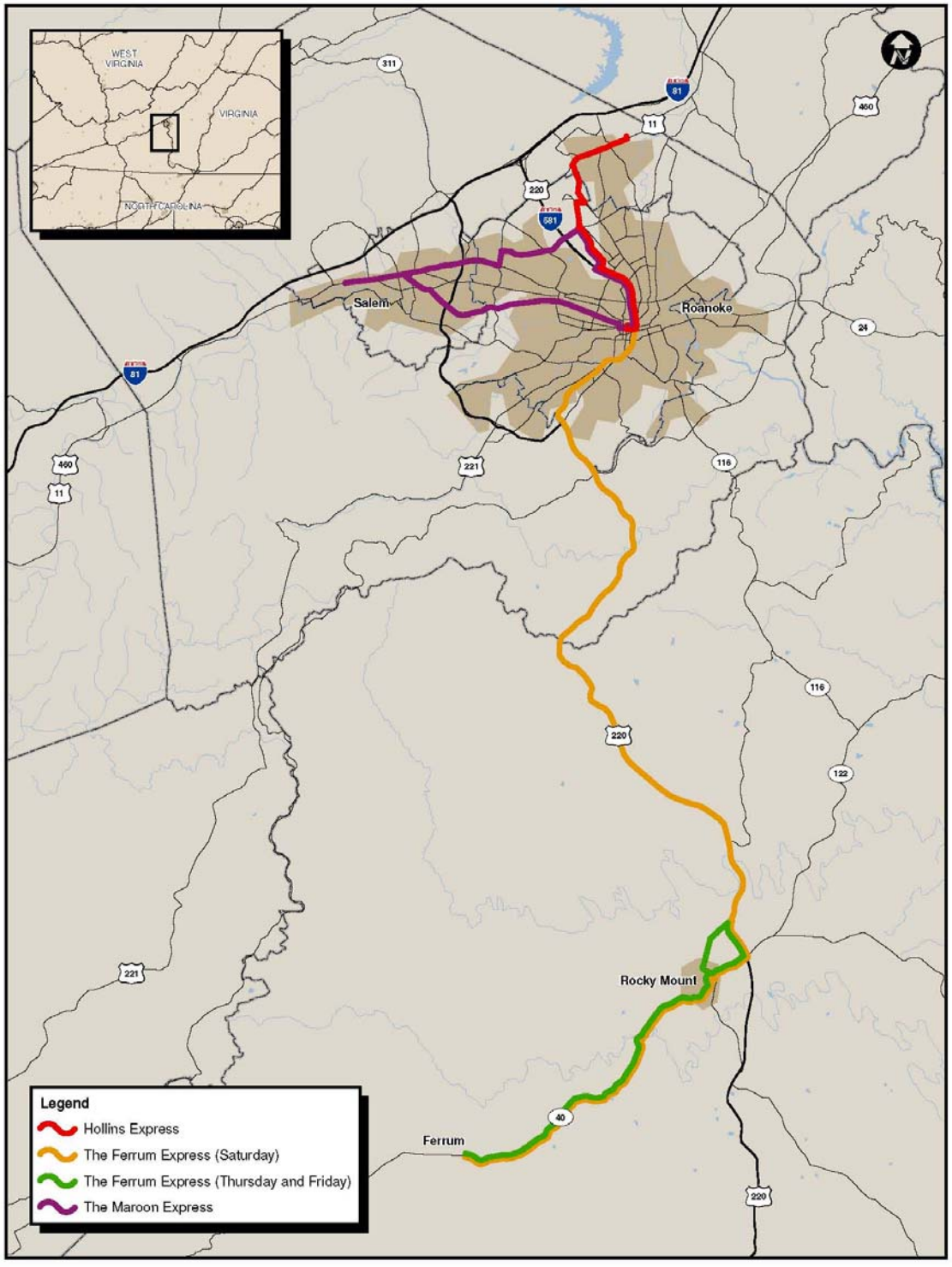


Figure 1-3. Roanoke Area Express Services

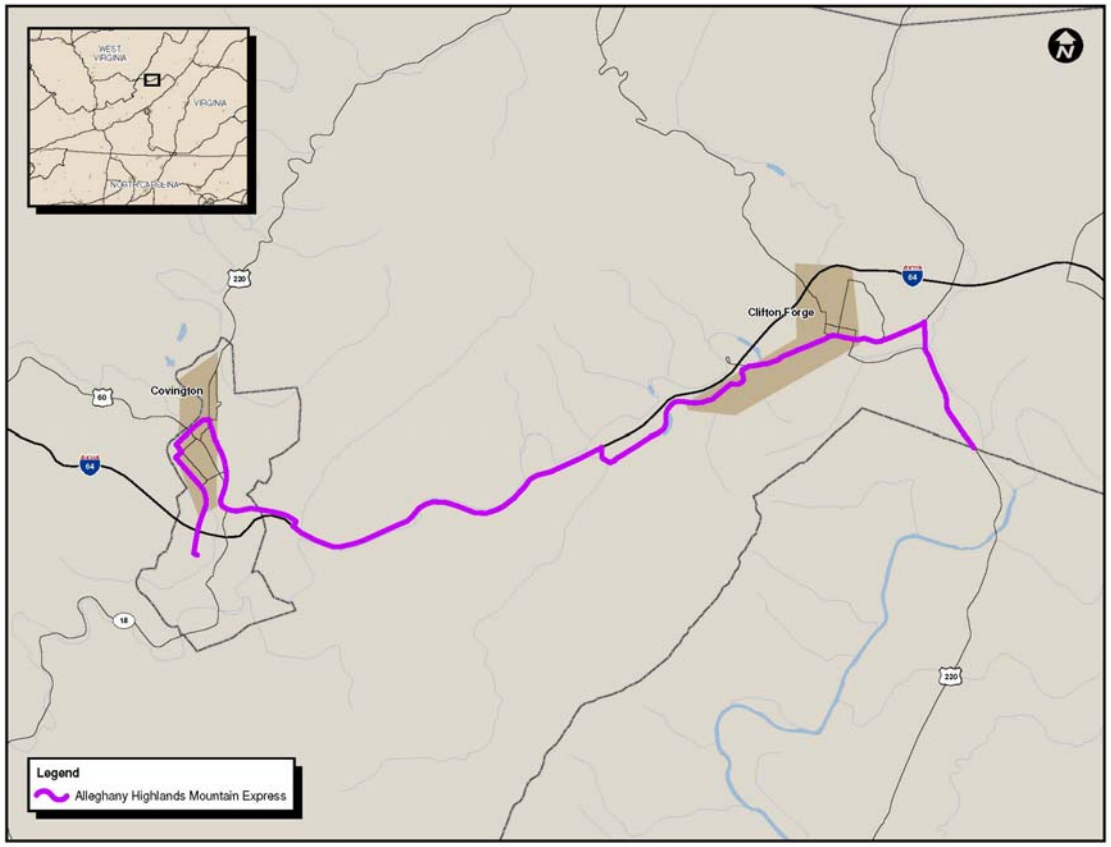


Figure 1-4. Alleghany Highlands Mountain Express

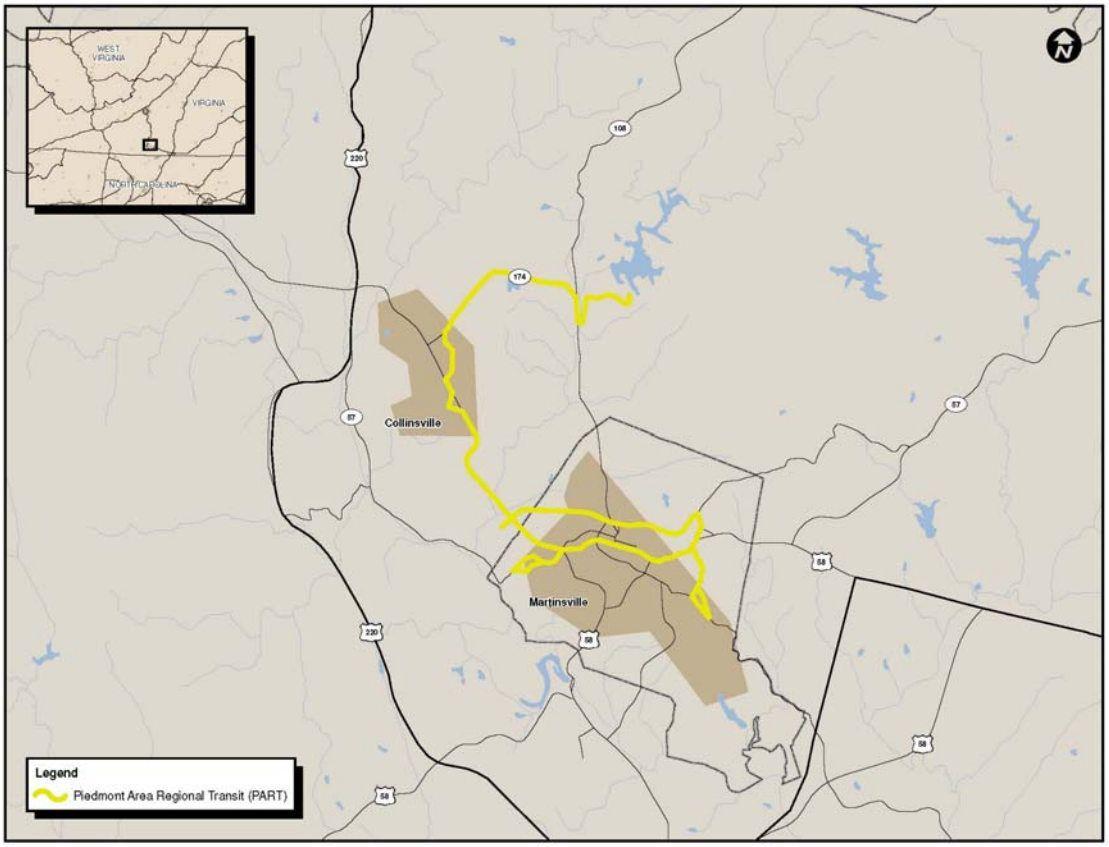


Figure 1-5. Piedmont Area Regional Transit

1.5 Fare Structure

Fares for the fixed routes are free, while for the deviated fixed routes, Mountain Express and Piedmont Area Regional Transit, fares are $0.50 and $1.00, respectively. Fares for the demand-response service provided by the CORTRAN and STAR systems are $3.50 and $3.00, respectively. These rates have been in effect for more than five years.

1.6 Fleet

The RADAR Transit system vehicle fleet is composed of 60 vehicles, 29 are DRPT funded. This fleet is primarily composed of body-on-chassis (BOC) transport vans capable of carrying between 7 and 15 passengers; one bus has capacity for 19 passengers. These buses are ADA-compliant; however, they are not equipped with bike racks. Other vehicles in the fleet include school busses, minivans, and administrative vehicles. A summary of the DRPT-funded vehicle fleet is presented in **Appendix C.**

The effective life of the fleet vehicles is estimated at 100,000 miles. In 2007/2008, DRPT-funded transit vehicles traveled approximately 889,000 of the 1,009,976 total miles driven, with

each vehicle traveling between 13,000 and 72,000 mi/year. The total mileage number includes RADAR services (RADAR Covington and RADAR Roanoke are the two subcomponents), as well as services provided to other agencies and organizations. RADAR Covington and RADAR Roanoke services ran approximately 115,000 miles in FY 2008. At this level of use, vehicles would be replaced on a two to seven or more year cycle. The spare fleet ratio is not applicable to RADAR Transit.

1.7 Existing Facilities

RADAR Transit completed construction of their new headquarters building in 2004. The 15,000 square foot (approx.) building was completed in September and the transfer from the old administration building was completed in October 2004. The new building provides all administrative, maintenance, storage, staging, and parking needs for the transit system. The building has been designed to meet all Americans with Disabilities Act (ADA) requirements.

Vehicle fueling is completed off site from the headquarters building with an arrangement with a private vendor. This site is located four blocks from the main headquarters building. RADAR Transit does not own any bus stations, transit centers, bus stops, or right-of-way. In addition, there are no railroad or bike facilities under the control of RADAR.

1.8 Transit Security Program

RADAR Transit has implemented several plans and programs to facilitate safety for the transit operators and passengers as well as the public at large. A System Security and Emergency Preparedness Plan was developed for the system; the current plan was finalized in January 2009.

Each transit vehicle is equipped with a two-way radio for general and emergency communication with the dispatch operator. RADAR completed late last year the installation of on-board vehicle data terminals that include a vehicle location system and are connected with their computerized scheduling system. Plans include the installation of cameras and other security features in the near future.

The new facility has a 16 camera security system with a 30 day recorder that monitors the perimeter and inside areas of the building. The parking lot is secured with a fence and an electric front gate opener that requires a security code to enter.

1.9 Public Outreach

Each year, RADAR develops an annual plan detailing marketing objectives for each month. The marketing plan includes items such as a variety of promotional strategies, local coordination opportunities, a golf fundraiser, and ridership surveys. These efforts are designed to raise awareness of RADAR's services with potential riders and human service agencies, to help raise funding for RADAR's operations, and ensure existing service satisfies riders' needs.

RADAR has a small annual marketing budget for promotion of its services. Since this budget will not support significant paid advertising, RADAR relies on free press whenever possible to raise awareness of its services. In addition to printing and distributing service brochures, RADAR places ads in newspapers and runs ads on government access channels. For 2009, RADAR has budgeted additional funds for the promotion of a new deviated fixed-route service operating in the City of Martinsville and Henry County (PART).

The Special Project Coordinator performs outreach to human service agencies, nursing homes, and senior groups. In addition, the Coordinator displays exhibits at health fairs, expos, human service assemblies, and training classes at all locations and services catering to populations that may benefit from RADAR services. RADAR held a one-day summit on regional transportation services that included participation from the Department of Rail and Public Transportation (DRPT) and the Community Transportation Association of Virginia (CTAV). On a continuing basis, RADAR staff members coordinate locally through participation in a bi-monthly City of Roanoke Mayor's Committee for People with Disabilities meeting, Community Alternatives Positive Prevention (CAPP) meetings in Allegheny County, and Technical Transportation Committee (TTC) meetings for the local planning district.

Awareness of the agency improved several years ago when RADAR standardized its vehicle design to a unified color scheme and logo. This improved branding and other marketing efforts have helped further establish RADAR as an important transportation resource in the Greater Roanoke Valley.

Information on RADAR services is publicly available in two primary formats: printed brochures and the RADAR website. These two sources of public information tend to have the same information: trip cost, service hours, and general operational information. The brochures-one for each service type-are distributed to several agencies and destinations in each of their respective service areas. Brochures are restocked as needed, frequently at the request of local suppliers of the materials. The RADAR website was recently redesigned. The new website will have enhanced functionality, permitting RADAR staff to update the website and post service alerts. It will also have links to DRPT, Valley Metro, and CATV.

2.0 GOALS, OBJECTIVES, AND STANDARDS

RADAR is a comprehensive public transportation service provider that operates a mixture of demand-response, fixed-route, and deviated fixed-route services across a wide portion of the Roanoke Valley region. As described in Chapter 1, these services have been operated for a number of years in the Cities of Roanoke, Salem and Covington; the Towns of Vinton, Clifton Forge, and Iron Gate; and the Counties of Franklin, Alleghany, Henry, and Roanoke. Most recently, RADAR began the provision of local bus service in the City of Martinsville and adjacent portions of Henry County under the designation of Piedmont Area Regional Transit (PART).

Since its creation in 1975, RADAR has been a not-for-profit community corporation. RADAR contracts with over 30 area social service agencies, local governments, and organizations to provide transportation services for their clients or citizens in the region. The RADAR Strategic Plan issued in January 2007 describes the agency's priorities, goals, strategies, and objectives.[1] The Strategic Plan also contains a description of the agency's Vision and Mission, which are as follows:

Vision

We envision RADAR to be a premier community transportation provider committed to safety, courtesy, quality, responsiveness, efficiency, and innovation.

Mission

The mission of RADAR is to provide public, specialized, and coordinated transportation which are safe, dependable, and cost effective thereby enhancing the quality of life and the environment in our service area.

Beyond these basic vision and mission statements, the Strategic Plan contains a description of the agency's "Guiding Principles" and the related "Priorities and Goals." These portions of the Strategic Plan are reproduced on the next several pages below.

[1] Unified Human Services Transportation Systems, Inc.; Strategic Plan; January 15, 2007.

The Strategic Plan

Vision and Mission

Vision

We envision RADAR to be a premier community transportation provider committed to safely, courtesy, quality, responsiveness, efficiency, and innovation.

Mission

The mission of RADAR is to provide public, specialized, and coordinated transportation which are safe, dependable, and cost effective thereby enhancing the quality of life and the environment in our service area.

Guiding Principles

Develop Community Benefit

To provide the community with benefits in an overall, not just a transit focused manner. By enhancing the ability of citizens to make a number of choices for transportation and by providing alternative transportation for those who are transportation disadvantaged.

Connectivity

To create ease of service between people, places, and modes, by assuring that reasonable ways to connect between different providers (of transit services) and different modes are not only available, but are truly easy to understand and easy to use.

Geographic Reach

To assure that the geographic locations and concerns of stakeholders, rural, urban, remote or local are thoughtfully integrated into planning and delivery of transit services to the greatest degree possible.

Customer Service

To make the customer the focus point of our processes, and assure that the ease of use, flexibility of service, and satisfaction of the customer is obsessive concern to RADAR, the providers, and other partners keeping in the mind the restrictions place upon RADAR by its funding sources and partners.

Teamwork

To work in collaboration, with our partners, stakeholders, and the public by demonstrating and practicing our willingness to continually improve how we work together for the benefit of the community.

Communicate – Openly, Directly, and Constantly

This is the underpinning for the success of the other principles. By this principle we are declaring that we are not only in this together, but we are willing to work in an open and honest manner on things. That background conversations will be brought to the foreground, gossip will be turned into an opportunity for mutual learning, and mistakes will acknowledged, forgiven, and used as the learning and growth opportunity that they represent.

Priorities and Goals

This section contains the actual text of the priorities and their corresponding goals.

Priority 1. Secure Stable Funding

Secure long-term funding from local, state, and federal sources to implement a regional community transportation system.

Goal 1: Develop an integrated financial plan for RADAR.

Goal 2: Create effective legislative support for funding by supporting the efforts of Community Transportation Association of Virginia.

Goal 3: Continue to support and maintain capital needs of coordinated human service/ public transportation

Priority 2. Public Education / Public Outreach

Promote Community Transportation through building a better understanding of the benefits to the community, and building grassroots supports for future funding discussions.

Goal 1: Increase visibility and use of existing transportation services.

Goal 2: Raise public awareness about the community benefits of community transportation and future services

Goal 3: Develop a RADAR branding campaign

Goal 4: Gain community leader support (public and private sector) for partners and services.

Goal 5: Expand outreach and information on available transportation options in the region.

Priority 3. Providing Efficient Service → Maximize Service

Focus on enhancing existing services by maximizing available resources, coordinating services to increase the benefits to the existing and potential passengers, and developing mobility management strategies through integration of modes, facilities and modern technology.

Goal 1: Provide an integrated and coordinated regional community transportation system that provides services on a more frequent basis.

Goal 2: Provide excellent transportation customer service to the residents living in our service area.

Goal 3: Coordinate specialized transportation services (seniors and disabled)

Goal 4: Coordinate administrative policies and procedures to make the service that is being offered to be safe, courtesy, and efficient as possible.

Goal 5: Strengthen existing technology and communication infrastructure and expand when needed.

Priority 4. Develop, Improve, and Increase Partnerships

Develop community partnerships with the public and private sector leaders and stakeholders within the region and statewide.

Goal 1: **Establish public and private partnership to support the services being offered by the Agency.**

Goal 2: **Build statewide understanding and support for Virginia transportation needs by being a member of local, state and national associations.**

Goal 3: **Create and advocacy program and land use policies that support the Agency's transportation system.**

Goal 4: **Provide technical assistance to the community regards to developing and planning of projects located in the Agency's service area.**

While the elements of the RADAR Strategic Plan provide a good description of the overall manner and direction by which the agency and its member organizations will undertake the achievement of its defined vision and mission, there are some elements of the discussion which could be expanded upon to describe the transit service provision aspects of the agency.

2.1 Goals and Objectives

As part of this TDP work effort, more specific public transportation related goals, objectives and standards have been defined to guide RADAR operations and activities over the TDP time period. Goals center on specific themes. Objectives have been defined within each goal. Future updates of regional planning documents, such as the RADAR Strategic Plan, the Roanoke Valley Area Metropolitan Planning Organization's (MPO) Long-Range Transportation Plan, the City of Roanoke and Roanoke County Comprehensive Plans and those of the other cities, towns, and counties in the RADAR service area, should take into consideration these goals and objectives.

GOAL 1: Provide Reliable Fixed-Route and Demand-Responsive Service that Meets the Transportation Needs of RADAR Service Area Residents

Objective 1.1: Provide transit service connections between residential areas and commercial areas with jobs, education, shopping, and medical services.

This objective is to be accomplished through the following minimum activities:

- Documenting and recording customer service requests;

- Working on a regular basis with the various City and County Economic Development Coordinators to identify planned new developments that might warrant transit service; and

- Surveying riders at least once every five years to determine rider service needs.

Objective 1.2: Provide easily identifiable stop locations along fixed routes and passenger shelters if warranted.

This objective is to be accomplished through the following minimum activities:

- Establish safe bus stop locations when modifying an existing alignment or implementing new service;

- Work with Town and County Public Works Department and Virginia Department of Transportation (VDOT) staff in providing new or expanding existing sidewalks at stops with high ridership demands; and
- Monitor ridership activity at high demand stops to determine if/when passenger shelters are needed.

GOAL 2: Market Existing Transit Services

Objective 2.1: Actively market transit services as a travel option within all of the cities, towns, and counties which comprise the RADAR service area.

This objective is to be accomplished through the following minimum activities:

- Maintain "RADAR System, Route and Schedule Guide" for users of the transit system;

- Maintain transit information on the RADAR web site and those of other town and county governments in the service area;

- Participate in community events to promote public transportation;

- Maintain a mailing list of organizations and social service agencies that represent markets that are likely to ride transit, and provide service information to those organizations and agencies.

Objective 2.2: Explore potential demand to expand cost-effective transit service to areas outside of those presently being serviced.

This objective is to be accomplished through the following minimum activities:

- Initiate or continue exploration meetings with City, Town, and County staff and officials to determine potential transit service needs, likely transit demand, service options, fare structure requirements that will provide farebox recovery ratios comparable to current RADAR services, and potential supplemental funding sources.

GOAL 3: Deliver Fixed-Route and Demand-Responsive Services in a Cost-Effective Manner

Objective 3.1: Maintain a system-wide farebox recovery ratio (farebox revenues/total operating expenses) that meets or exceeds standards identified in Section 2.2 of this TDP.

This objective is to be accomplished through the following minimum activities:

- Record and monitor trends in passenger trips by route; and

- Record and monitor monthly transit operations expenses and farebox revenues.

Objective 3.2: Hold administrative costs to approximately 24 percent of the system's total annual operating budget.

This objective is to be accomplished through the following minimum activities:

- Record and monitor monthly transit operations expenses and farebox revenues.

Objective 3.3: Achieve system-wide fixed route ridership levels that meet or exceed standards identified in Section 2.2 of this TDP.

This objective is to be accomplished through the following minimum activities:

- Maintain and monitor monthly ridership reports for fixed-route and demand-responsive service, with ridership reported on a route-segment basis for fixed routes; and

- Implement corrective measures if ridership falls below established standards for specific routes for more than two (2) months in a row. Such corrective measures may include: route alignment, service frequency and span of service adjustments, and/or fare adjustments.

GOAL 4: Deliver Fixed-Route and Demand-Responsive Services in a Safe Manner

Objective 4.1: Ensure that transit service operators maintain an accident rate of less than the standard identified in Section 2.2 of this TDP.

This objective is to be accomplished through the following minimum activities:

- Maintain a training program for new employees; and
- Review established Operating Policies and Procedures at least once a year and update as necessary. Review those policies and procedures as part of all training efforts with new staff. Also review with existing staff at least once every two years.

Objective 4.2: Ensure that an adequate fleet of vehicles is maintained for the fixed-route and demand-responsive services.

This objective is to be accomplished through the following minimum activities:

- Identify the need for replacement vehicles based on industry standards for defined useful life of vehicles. For most buses operated by RADAR, the defined useful life is a time period of 4-years or 100,000 revenue miles of operations, whichever comes first; and
- Maintain a spare ratio of at least one (1) bus for each of the major geographically separated fixed-route transit services.

GOAL 5: Provide Transit Services That Are Accessible to Citizens

Objective 5.1: Provide transit services that are accessible to all population groups within the multi-county RADAR service area.

This objective is to be accomplished through the following minimum activities:

- Comply with the applicable requirements of the Americans with Disabilities Act (ADA); and
- Provide the ADA-eligible population with origin to destination paratransit service that is comparable to service provided by the fixed-route system.

2.2 Service Performance Standards

This TDP work effort has also identified the following service standards that are to be monitored on a monthly basis by RADAR administrative staff.

Ridership Service Productivity Measures

The following system-wide service standards are proposed based on a review of ridership characteristics over the past several months:

Fixed-Route Standard – Monthly system-wide fixed route ridership should maintain levels equivalent to 5.00 passenger trips per revenue hour of service provided.

Demand-Responsive Standard – Monthly base demand-responsive service should maintain ridership levels equivalent to 2.00 passenger trips per revenue hour with average ride times not exceeding 50-minutes. Monthly demand-responsive service should maintain ridership levels equivalent to 1.00 passenger trips per revenue hour with average ride times exceeding 50-minutes.

Corrective measures should be investigated if ridership on RADAR's fixed route system and/or demand-responsive system fall below the levels identified above for three (3) consecutive months.

Cost Effectiveness Measures

Fixed-Route Standard - RADAR's farebox recovery ratio (farebox revenues as a percentage of operating expenses) for fixed route services shall remain at approximately 5.0 percent. Corrective measures should be investigated if the farebox recovery ratio falls below this standard for a period of three (3) months in a row.

Demand-Responsive Standard – RADAR's farebox revenues for demand-responsive service should remain at a farebox recovery ratio of approximately 5.0 percent. Corrective measures should be investigated if the farebox recovery ratio falls below this standard for a period of three (3) months in a row.

Vehicle Maintenance Performance Measures

The following two standards shall be monitored with regards to vehicle maintenance performance:

Bus Preventive Maintenance Inspections – Preventive maintenance shall be conducted on all vehicles in the transit fleet per vehicle manufacturer recommendations.

Revenue Vehicle Failures – RADAR should maintain a standard of no more than 0.15 revenue vehicle failures per 1,000 revenue bus-miles of service.

3.0 SERVICE AND SYSTEM EVALUATION

The purpose of Chapter 3 of the TDP is to describe the recent performance of the RADAR Transit system relative to generally accepted performance standards. In simple terms, this assessment describes the manner in which RADAR Transit is providing public transportation services to the residents of the multi-county region in which it operates. Each of the following sections discusses one facet of this evaluation process.

3.1 Historical and Existing Service Perspective

RADAR Transit is one of the more established public transportation systems in the Commonwealth of Virginia.

RADAR was formed in 1975 as a not-for-profit community corporation that would contract with area social service agencies, local governments, and other organizations in the Roanoke Valley area to provide transportation services. Since the time of its establishment, the RADAR system has grown and expanded to where it now provides a range of public transit services via traditional fixed-route/fixed-schedule, deviated fixed-route, and demand-response type operations. The system runs three fixed express service routes (Hollins Express, Ferrum Express, and the Maroon Route), two deviated fixed routes (the Mountain Express in the Clifton Forge/Covington area and the Piedmont Area Regional Transit service in the Martinsville/Henry County area), and two demand-response services (CORTRAN and STAR in the Roanoke metropolitan area).

As the system has continued to grow and expand, changes have been regularly observed in virtually all relevant comparative factors, from the number of revenue-miles and revenue-hours operated each year to the total system operating costs and the number of passengers transported. With many of the service changes having been observed over just the past several years, it is difficult to apply a traditional five year service history to the system.

The most comprehensive assembly of statewide system performance data for public transit systems in Virginia was published in 2007.[2] Although the title of this statewide transit performance report indicates that it presents data for the period FY2002 to FY2006, this information is typically only provided for the larger and better established urban bus and rail systems in the Commonwealth. In the case of RADAR Transit and virtually all of the other small municipal and rural public transit systems in the state, only data for FY2006 is provided in this report. As a result, the historical evaluation of RADAR Transit operations associated with this TDP has only been able to consider the three year period from FY2006 through FY2008. **Table 3-1.A. and Table 3-1.B.** illustrates several operating statistics in each of these three years for the different types of RADAR operated services.

[2] Virginia Transit Performance Report (FY2002-FY2006); Virginia Department of Rail and Public Transportation; Richmond, Virginia; 2007.

Table 3-1.A. Historical Demand Response Operating Statistics for RADAR Transit FY2006-FY2008

Operating Statistics	FY2006	FY2007	FY2008
Annual Passengers	2,952	7,097	8,568
Annual Operating Costs	$ 112,365	$ 177,795	$ 167,954
Annual Revenue Miles	40,878	51,732	70,032
Annual Revenue Hours	2,649	4,653	4,004
Passengers per Revenue Mile	0.07	0.14	0.12
Passengers per Revenue Hour	1.11	1.53	2.14
Cost per Passenger	$38.06	$25.05	$19.60
Cost per Revenue Mile	$2.75	$3.44	$2.40
Cost per Revenue Hour	$42.42	$38.21	$41.95

Source: Virginia Department of Rail and Public Transportation

Table 3-1.B. Historical Fixed Route Operating Statistics for RADAR Transit FY2006-FY2008

Operating Statistics	FY2006	FY2007	FY2008
Annual Passengers	14,160	11,093	13,249
Annual Operating Costs	$ 137,440	$ 133,995	$ 134,628
Annual Revenue Miles	46,393	42,018	43,896
Annual Revenue Hours	3,121	2,334	2,484
Passengers per Revenue Mile	0.31	0.26	0.30
Passengers per Revenue Hour	4.54	4.75	5.33
Cost per Passenger	$9.71	$12.08	$10.16
Cost per Revenue Mile	$2.96	$3.19	$3.07
Cost per Revenue Hour	$44.04	$57.41	$54.20

Source: Virginia Department of Rail and Public Transportation

As shown in **Table 3-1.A, Table 3-1.B**, and **Figure 3-1**, the total number of annual passengers on the system increased from 17,112 persons in FY2006 (2,952 on the demand-response operations and 14,160 on the fixed-route service) to 21,817 in FY2008 (8,568 on demand-response and 13,249 on fixed-route) with the annual ridership in FY2007 being slightly higher at 18,190 persons (7,097 on demand-response and 11,093 on fixed-route). This system-wide net increase in ridership of 4,705 persons over a period of two years represents a 27.0 percent increase over this time period. Much of this reported ridership increase appears to be attributable to the continuing expansion in the amount of transit service being provided by RADAR Transit, from about 87,300 revenue miles in FY2006 to about 113,900 miles in FY2008 (an increase of about 30 percent in revenue miles) and from 5,770 revenue hours in FY2006 to

6,488 revenue hours in FY2008 (about a 12.4 increase in annual revenue hours). As would be expected with increases in the amount of service provided, annual system operating costs, as shown in **Figure 3-2**, also experienced an increase, from about $249,800 in FY2006 to about $302,600 in FY2008 (an increase of about 21.1 percent).

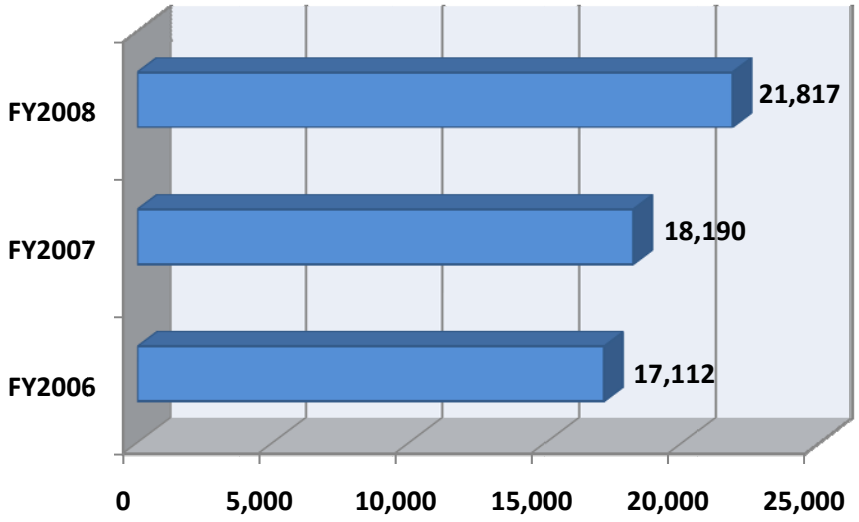


Figure 3-1. Annual Passengers, FY2006-FY2008

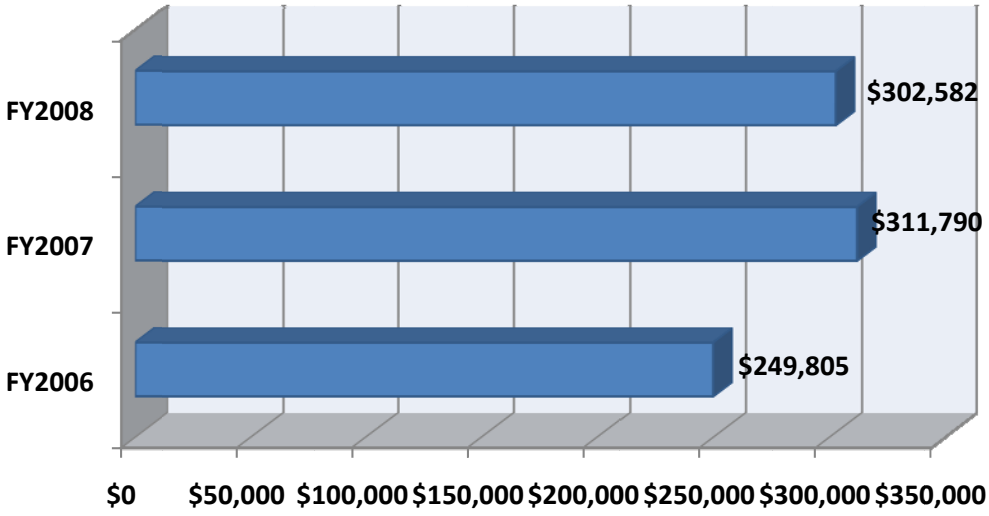


Figure 3-2. Annual Operating Costs, FY2006-FY2008

When these total annual values are expressed in terms of unit factors, some generalized conclusions can be drawn. The average passengers per revenue hour value of 2.97 observed in FY2006 increased to a value of 3.36 passengers per revenue hour in FY2008 (note that these combined statistics for the demand-response and fixed-route service can be found in **Appendix D**). This represents a 13.1 percent increase in this productivity factor.

Similarly, the average cost per passenger decreased from $14.60 per passenger in FY2006 to $13.87 per passenger in FY2008, or a decrease of about five percent. Much of this decrease appears to be attributable to the observed decrease in the fixed-route service's operating costs, combined with much higher ridership in the demand-response service's operations.

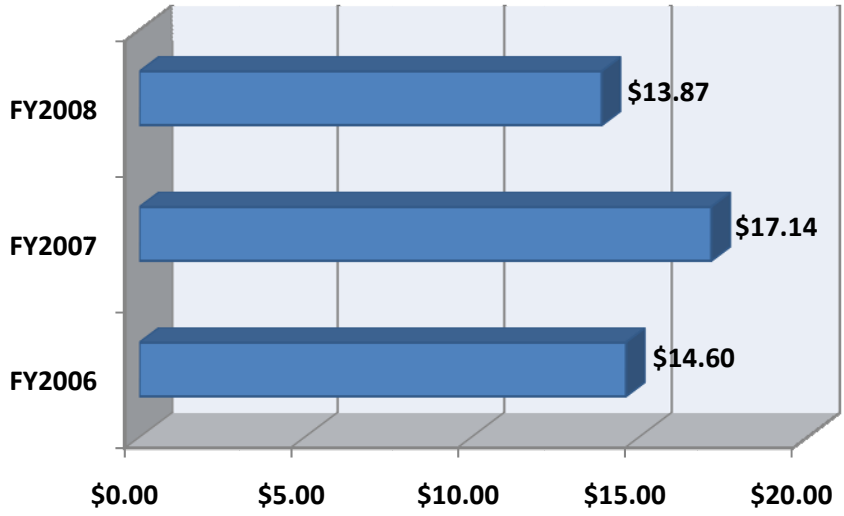


Figure 3-3. Cost Per Passenger, FY2006-FY2008

All of these cost and ridership response factors will need to be regularly monitored and reported by the system's management in order to identify trends of both a positive and a negative nature.

3.2 Peer System Review

A useful activity associated with the preparation of a transit development plan is the comparison of the performance characteristics of the subject system with those systems of a similar size. At the national level, all public transit agencies are required to report such information to the Federal Transit Administration (FTA) for inclusion in the National Transit Database (NTD) unless they are granted a reporting exemption. Since its original establishment, the NTD has developed uniform standards and procedures for the reporting of this information on an annual basis. With all transit agencies having to report the same information to NTD in the same manner, this database provides a consistent set of data that can be used for a peer group type of analysis.

While the NTD was originally developed to allow for the consistent compilation of comparable statistics for transit systems operating in metropolitan areas of 50,000 population or greater, it was subsequently expanded to include all urban and rural public transportation operations across the country. Particularly in the case of smaller urban and rural transit systems, the state departments of transportation compile the individually submitted annual operating statistics

and provide this information to NTD. In the Commonwealth of Virginia, this data compilation and submittal function is provided by the Department of Rail and Public Transportation (DRPT).

It is important to keep in mind that while all public transit systems report the same information in the same manner, each system has a unique set of administrative and governmental, operating, and financial characteristics associated with it. Thus, while several systems may appear to be similar to one another through a comparison of basic operating statistics, they are not identical in all respects to their designated "peers". The peer group comparison for RADAR Transit was limited to the use of available information on other similar rural demand-responsive and rural fixed-route public transit systems currently operating in the Commonwealth of Virginia. Separate peer groups were selected for the demand-response service and for the fixed-route service operated by RADAR.

While this geographically-oriented process of peer group selection may have resulted in a wider than desired range of values for some system characteristics, such as service area population or number of vehicles operated during peak periods, it did ensure that all of the peer systems were known quantities to DRPT staff and had been in operation for a reasonable period of time. Using this process, the following two groups of candidate peer transit systems was identified:

Demand Response

- JAUNT Inc.
- Greene County Transit
- Virginia Regional Transit (VRT) – Culpeper County
- Virginia Regional Transit (VRT) – Page County

Fixed Route

- STAR Transit System
- Four County Transit System
- District 3 Transit System
- FRED - Caroline County
- FRED – King George County
- VRT Shenandoah Blue Ridge

Table 3-2.A. and **Table 3-2.B.,** respectively, summarize the performance indicators for each of these selected peer transit agencies and RADAR Transit.

Table 3-2.A. Peer Group Comparison Summary
Demand Responsive Operations

Performance Indicators	Peer Group Transit Systems					
	JAUNT, Inc.	Greene County Transit	VRT - Culpepper County	VRT - Page County	Average	RADAR (Demand Response)
Total System Operating Cost	$4,566,275	$472,293	$120,878	$102,669	$1,315,529	$167,954
Total Vehicle Revenue Miles	1,750,276	246,307	41,826	44,381	520,698	70,032
Total Vehicle Revenue Hours	83,564	10,998	2,048	2,048	24,665	4,004
Total Unlinked Passenger Trips	270,875	52,129	4,515	8,028	83,887	8,568
Passengers per Revenue Mile	0.15	0.21	0.11	0.18	0.16	0.12
Passengers per Revenue Hour	3.24	4.74	2.20	3.92	3.40	2.14
Cost per Trip	$16.86	$9.06	$26.77	$12.79	$15.68	$19.60
Cost per Vehicle Revenue Mile	$2.61	$1.92	$2.89	$2.31	$2.53	$2.40
Cost per Vehicle Revenue Hour	$54.64	$42.94	$59.02	$50.13	$53.34	$41.95

Note: All data for Fiscal Year 2008 ending September 30, 2008 unless otherwise noted.

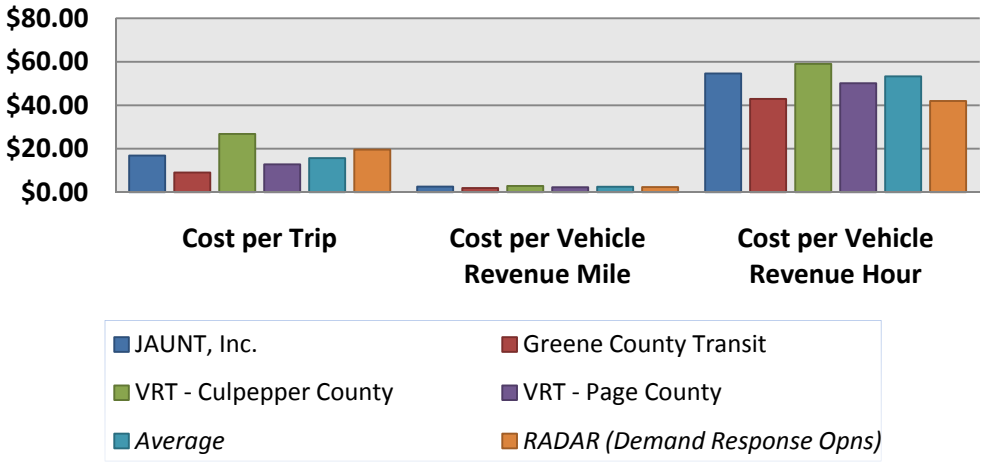


Figure 3-4.A. Peer Comparison-Demand Responsive

As shown in **Table 3-2.A.**, by comparison to the average values for the four peer systems, the RADAR demand-response operation has significantly lower values in terms of total system operating cost, total vehicle revenue miles, total vehicle revenue hours, and total unlinked passenger trips. The table illustrates that RADAR Transit (demand response) is not one of the larger rural demand responsive public transit systems operating in the Commonwealth.

Generally speaking, the RADAR system's numbers fall in between those associated with the four peer systems. However, the operating statistics for the JAUNT Inc. system, which operates in the Charlottesville/Albemarle County area, are so much higher than RADAR's that they exaggerate the discrepancies between the systems. The next largest such system, Green County Transit, has annual operating costs and annual ridership values that are almost three and six times, respectively, that associated with RADAR Transit. These findings all appear to be quite reasonable because RADAR Transit's demand response service serves a much smaller geographic area than do the two larger peer systems. The RADAR demand-response service is also being provided as a supplement to the Roanoke Valley Metro urban area fixed-route/fixed-schedule bus transportation system whereas these other two peer systems are the only public transit operations serving their respective primary service areas. The service area of the RADAR demand-response service covers the City of Roanoke and the surrounding more-developed portions of Roanoke County; while the two larger peer systems operate in either multiple counties (JAUNT) or are the sole provider in a single county (Greene County Transit).

According to the data, the overall average unit operating cost for RADAR's demand-response service is lower than the comparable average value for the other six peer systems. The RADAR demand-response service average cost per passenger trip value of $19.60 in FY2008 is about 25 percent above the peer group average value of $15.68 per trip. However, RADAR's demand-response service average cost per revenue mile value of $2.40 is comparable to the peer group average value of $2.53 and the average cost per vehicle revenue hour of $41.95 is almost 21 percent less than the peer group average value of $53.34. These numbers show that RADAR Transit operates at a good level of efficiency for their system. The summary results also show that RADAR's demand-response service has a lower number of passengers per revenue mile and passengers per revenue hour than the average numbers of the four peer systems.

Table 3-2.B.Peer Group Comparison Summary
Fixed Route/Fixed Schedule Operations

	Peer Group Transit Systems							
Performance Indicators	**STAR Transit System**	**Four County Transit**	**District 3 Transit System**	**FRED (Caroline County)**	**FRED (King George County)**	**VRT - Shenandoah Blue Ridge**	**Average**	**RADAR (FR/FS)**
Total System Operating Cost	$492,546	$1,629,633	$1,514,423	$179,383	$292,614	$278,820	$731,237	$134,628
Total Vehicle Revenue Miles	341,564	1,154,672	598,932	128,232	166,358	137,367	421,188	43,896
Total Vehicle Revenue Hours	14,250	56,874	47,543	3,794	5,796	6,434	22,449	2,484
Total Unlinked Passenger Trips	40,999	184,140	210,507	6,189	15,867	30,851	81,426	13,249
Passengers per Revenue Mile	0.12	0.16	0.35	0.05	0.10	0.22	0.19	0.30
Passengers per Revenue Hour	2.88	3.24	4.43	1.63	2.74	4.79	3.63	5.33
Cost per Trip	$12.01	$8.85	$7.19	$28.98	$18.44	$9.04	$8.98	$10.16
Cost per Vehicle Revenue Mile	$1.44	$1.41	$2.53	$1.40	$1.76	$2.03	$1.74	$3.07
Cost per Vehicle Revenue Hour	$34.56	$28.65	$31.85	$47.28	$50.49	$43.34	$32.57	$54.20

Note: All data for Fiscal Year 2008 ending September 30, 2008 unless otherwise noted.

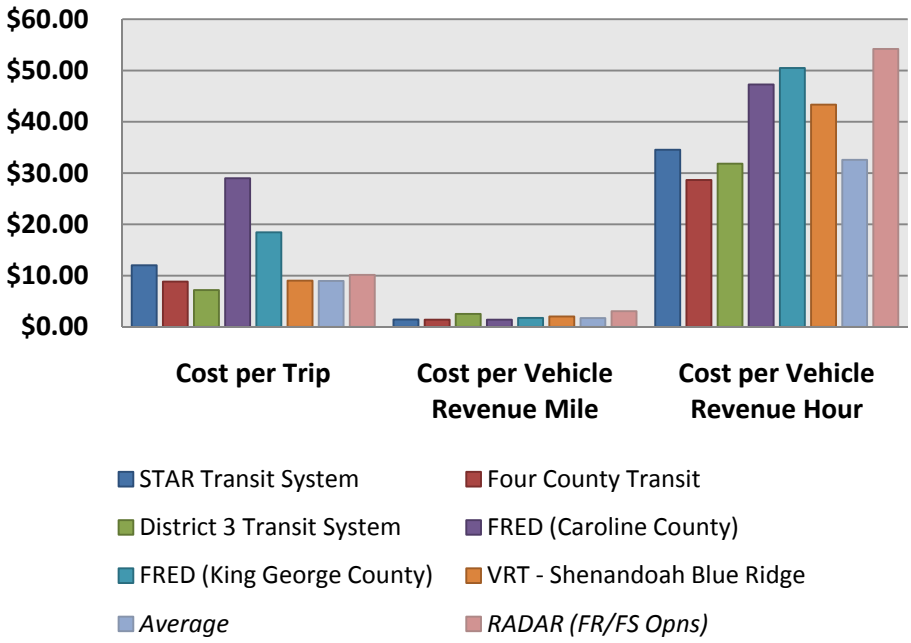


Figure 3-4.B. Peer Comparison-Fixed Route Fixed Schedule

As shown in **Table 3-2.B. and Figure 3-4.B.**, by comparison to the average values for the six peer systems, the overall average unit operating cost for RADAR's fixed-route service is generally lower than the comparable average value for the other six peer systems. The RADAR average cost per passenger trip value of $10.16 is about 13 percent above the peer group average value of $8.98 per trip. RADAR's average cost per revenue mile value of $3.07 is 76 percent higher than the peer group average value of $1.74 and the RADAR fixed-route service average cost per vehicle revenue hour of $54.02 is almost 66 percent above the peer group average value of $32.57. These numbers show that RADAR's fixed-route service operates at a mixed level of efficiency for their system. Much of the higher cost has to do with the length of the fixed service routes. The summary results also show that RADAR has a higher number in terms of passengers per revenue mile and passengers per revenue hour than the average numbers of the six peer systems.

These findings illustrate that RADAR is one of the smaller rural fixed-route public transit systems now operating in the Commonwealth. The next largest similar system, FRED in Caroline County, has annual operating costs and annual ridership values that are more than 133 percent of that associated with RADAR's fixed-route service. These findings all appear to be quite reasonable in that RADAR serves a large service area, but only with limited fixed-route service; in addition, the larger established Valley Metro Transit provides the majority of the fixed-route service in the City of Roanoke.

3.3 On-Board Passenger Survey

Appendix E at the end of this report presents a technical memorandum with detailed findings from the on-board transit rider survey.

3.4 Level of Support for Transit

The RADAR service has created a positive reaction from the people of the region served by the system. When it initiated transportation services, RADAR's service area was limited to the Roanoke City limits. Citizens and other local governments requested transit service from RADAR and this service would typically be provided on a demonstration basis for some period of time. If determined to be successful, the service has continued to be operated with the use of federal, state, and local government financial support to supplement passenger fares.

The change in transit service demand appears to be generally keeping pace with observed population growth in the region. RADAR has opportunities for potential system growth, but recent limitations on funding provided by the different federal, state, and local government agencies is the major constraint on the ability to expand the services beyond what is presently being provided.

At a stakeholder meeting conducted on January 13, 2009 (see **Appendix F** for a copy of the meeting minutes), the following comments were offered by the attendees regarding the current RADAR Transit service:

- Stakeholder likes the idea of Sunday service and extended hours; but understands the issue of costs and budget reductions.

- The increasing senior citizen population suggests the need for more door-to-door / demand-response type service.

- A growing carless population anticipated in and around 2020 – 2030 will also be a potential source of new ridership; but will require accommodations including ride matching, bike accommodations, etc.

- The demographics will continue to drive the need for public transportation; not only through increased population, but also air quality concerns in the region. This will give an opportunity for the State to market and fund changes and make a statewide message about their vision for the future.

In general, there appears to be a good level of local government support for the continued operation of RADAR but the finances of all of the local governments are being strained at the present time. As a result, the potential for significant increases in local operating assistance is viewed as being unlikely over the next couple of years.

3.5 Focus Groups and General Community Input

RADAR has not conducted any formal focus group meetings with existing riders to discuss transit services and potential changes to the route structure and/or the current level of service.

Feedback to RADAR management on these topics has come most recently from comments provided on the ridership surveys conducted in early 2009 and historically from direct one-on-one communication with the system's bus drivers by the local riders.

3.6 Recent Changes in Patronage, Operating Costs, and Operating Revenues

As stated previously, RADAR's annual ridership has generally increased since the inception of service. This increase occurred through a combination of route expansion, greater public awareness of the system, and economic factors. Recently, ridership has continued to hold steady and increase slightly even with no route expansion. Annual system operating costs have recently increased for various reasons, including increased fuel/oil costs. With the recently imposed FY2009 DRPT budget cuts and an inability for sponsoring organizations/counties to make up the resulting deficit, there may be a shortfall in operating revenue in the future.

3.7 Deviations from Service Standards and Potential Remedies

As a deviated fixed-route and demand-responsive public transportation program whose service area encompasses urban as well as large and generally low density rural portions of the Commonwealth, there are a number of different services standards and operating guidelines that can be applied to the operations of the RADAR system. Some of these service standards and operating guidelines have been developed at a national level through research sponsored by the Federal Transit Administration (FTA) or by the Transit Cooperative Research Program (TCRP) of the Transportation Research Board. Others have been developed with a focus on rural public transit services being operated in an individual state. At the present time, DRPT has not developed a set of general transit service standards for application to rural systems such as RADAR.

In May 2002, the Maryland Transit Administration of the Maryland Department of Transportation published a report titled "Maryland Transit Guidelines." Prepared in conjunction with the Maryland Comprehensive Transit Plan (MCTP), the Maryland Transit Guidelines were defined as having four primary objectives or purposes[3]:

1. Provide technical guidance to transit agencies and transit providers throughout Maryland.
2. Create consistency in transit service and infrastructure throughout Maryland.
3. Establish measurable guidelines for transit.
4. Provide a basis for securing funding for transit improvements.

Demand-Responsive Service Factor Evaluation:

The Maryland Transit Guidelines encompassed all of the transit modes operating in the state, from large urban fixed-guideway systems to small urban area bus and rural demand-responsive

[3] Maryland Transit Guidelines, Maryland Transit Administration, Baltimore, Maryland; May 2002, Page 2.

services. For the purposes of the RADAR TDP, the following Maryland service guidelines developed for application to rural, general public, demand-responsive transit services were applied:

- Reservations
- Span of Service
- System Access and Availability
- Directness
- Dependability
- Rider Compliance and No Show Policy
- Financial

Reservations. This criterion delineates both the minimum and maximum amount of time in advance of requested service that a rider is required to place a reservation with the transit system operator. The MTA minimum reservation period for non-ADA service such as operated by RADAR is "noon on the prior day" and the maximum reservation period is two weeks. RADAR requires a 24-hour advance notice for individual trips and allows for regular trips to be prescheduled two weeks in advance. **The current service thus satisfies the Reservations service guideline**.

Span of Service. The MTA guidelines define "span of service" as the duration of time when service is "made available" and is measured from the earliest to the latest pick-up times. For rural, non-ADA services, the MTA guidelines define span of service as from 7:00 AM to 6:00 PM on weekdays. RADAR currently operates the following demand-response service from Monday through Friday: between the hours of 5:45 AM and 5:45 PM for STAR and between the hours of 7:00 AM to 7:00 PM for CORTRAN. **The current service thus appears to satisfy the Span of Service guideline.**

Loading Guideline. The MTA service guidelines indicate that no standees are permitted at any time on demand-responsive vehicles throughout the State of Maryland. **RADAR satisfies this guideline by requiring all passengers to wear seatbelts at all times on the vehicles and never allowing standees on any trip.**

System Access and Availability. The MTA guidelines define the minimum "access" for demand-responsive service to be the provision of "curb-to-curb" transportation. This guideline is being satisfied by RADAR. The MTA guideline for "availability" defined compliance as service being provided for any trip purpose on a space/time available basis within the agency's operating service area. **RADAR is in full compliance with both guidelines across its service area.**

Directness. The MTA guidelines recommend that a demand-responsive trip should take no more than an hour (60 minutes) for a driving distance of up to 20 miles and discourage transfers on demand-response systems. **RADAR does not schedule passenger transfers and based on gathered information associated with the limited service area, the maximum trip time guideline is also being satisfied.**

Dependability. The MTA guideline for dependability measures whether the service is operated as scheduled and whether the service picks up all passengers who have made reservations. The MTA service guidelines involve two criteria: schedule adherence and trip fulfillment. The MTA schedule adherence criteria define "on-time" as being 15 minutes early to 15 minutes late for pick-ups and up to 15 minutes late for drop-offs. The associated "on-time" percentage for pick-ups and drop-offs is 90 percent.

RADAR Transit currently operates a computerized passenger reservation, driver assignment, and vehicle dispatching system. Driver assignment sheets define the time of all scheduled pick-ups over the course of the service day and drivers record the actual times that pick-ups and drop-offs take place for each trip. **Based on gathered information, the schedule adherence guidelines generally appear to be satisfied. Similarly, the trip fulfillment criterion is being satisfied by all scheduled trips being served.**

Rider Compliance and No Show Policy. All demand-responsive transit system operators should strive to provide all eligible patrons with no turn downs. To accomplish this, people who are consistent "no shows" must be denied service so that other riders can use the available system capacity. RADAR has implemented and maintains a consistent set of policies related to rider compliance and "no shows". Records are maintained of those persons who make a reservation but are not available to be picked up within the designated time period or who cancel a reservation on short notice. Written notification is provided to these individuals of the potential for suspension of service if the situation continues. Suspension of service has been applied where necessary and appropriate. **It appears that this service criterion is being satisfied.**

Financial. The cost of operating a demand-response transit system can be measured by several basic financial factors. The most commonly used factors are the average system-wide cost per passenger and the average system-wide cost per vehicle hour of service provided. As described earlier in this chapter, RADAR appears to be operating an efficient and cost-effective service. The current average cost per passenger during Fiscal Year 2008 was $19.60, a value approximately 25 percent higher than the average cost per passenger of four other peer transit systems in the Commonwealth. Conversely, RADAR's average cost per vehicle hour of service provided was $41.95 during Fiscal Year 2008, a value approximately 21 percent lower than the average experienced by the other four peer transit systems. **It would thus appear that RADAR is providing service in a reasonably cost-effective manner when compared to its peer systems.**

Fixed-Route and Deviated Fixed-Route Service Standards Evaluation:

A separate group of service guidelines have been developed by MTA for application to small urban and rural fixed-route transit operations. The application of each of these guidelines to the current operations of RADAR is discussed below. For the purposes of the RADAR TDP, the following Maryland service guidelines developed for application to fixed-route bus transit services will be applied:

- Consideration of Service
- Frequency of Service
- Span of Service
- Loading Guidelines
- Service Availability and Bus Stop Spacing
- Directness
- Dependability
- Financial
- Productivity

The application of each of these guidelines to the current operations of RADAR's Fixed Route – Fixed Schedule service is discussed below.

Consideration of Service. Among the most difficult decisions that a transit agency must make is the determination of which residents and activity centers will receive service. The transit agency receives many requests for service from citizens and businesses who are not within walking distance of any route or who would like transit routes in their neighborhoods to serve different destinations. Because transit resources are limited, it is difficult to accommodate everyone. Therefore, it is necessary to determine how to allocate the available resources to provide the best possible service. This guideline defines the minimum thresholds for employment concentrations, shopping center size, hospital size, college enrollment, and residential dwelling units that warrant consideration of service. In addition, the guidelines include qualitative factors that should be considered in indicating specific areas that a transit agency should consider for providing fixed-route transit service.

Transit service should be provided to activity centers that produce a relatively high number of trips. To assist in determining what constitutes a "major" activity center, minimum threshold levels have been suggested for different categories of activity centers. The threshold levels are designed to serve as guidelines in determining which activity centers in each category should be given primary consideration for the provision of public transportation service.

Table 3-3. Minimum Levels for Consideration of Transit Service

Activity Center	Urban	Suburban	Rural
Business concentrations (number of employees)	500	300	100
Shopping centers (size in square feet)	350,000	200,000	50,000
Hospitals (number of beds)	200	100	All
Colleges (number of students)	2,000	1,000	All
Housing developments (number of dwelling units)	400	200	100

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 9.

In addition, there are several qualitative factors that can also be used to determine which areas should be considered for transit service. These include the following:

- *A sufficiently high population density in terms of persons per square mile in the service area*. A high population density generally indicates that an area contains the concentration of population necessary to support reasonable levels of use. However, it should be recognized that there are differences in population density and development patterns among urban, suburban, and rural service areas.

- *Service should be provided to transit-dependent populations*. The transit dependent require transit service to meet their basic transportation needs. Transit dependent segments of the population include those who do not have use of an automobile. The percentage of senior citizens and the location of low income housing are also measures frequently used to determine transit dependency.

- *Transit service should be provided to support economic development*. Transit service can support existing and attract potential economic activity and consideration of service should take this into account.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable. **All of the RADAR fixed-route service routes meet the enrollment levels presented.** The transit route for the Mountain Express operates along the major travel corridors between the communities of Covington and Clifton Forge, which define its primary service area. Since these major travel corridors are also the locations of all of the major businesses, shopping centers, hospitals and other medical facilities, and colleges in Alleghany County, this service factor is being satisfied. Most of the larger residential developments in the service area are also located immediately adjacent to, or within a reasonable walking distance, of the current RADAR deviated fixed-route services. Likewise the PART Route in Henry County and the City of Martinsburg also meets this requirement for the same reasons.

Frequency of Service. Frequency is expressed as the interval of time between successive transit vehicles at a particular location on a route. This length of time is defined as a route's "headway." Typically, more frequent service is regarded as more attractive service. Frequency of service is important in determining system operating cost and must match the financial capability and policy of the system.

Service frequency can be based on demand or policy considerations as to what the public considers attractive service. Demand considerations require the operator to provide a sufficient number of trips on a transit route to accommodate the passenger volume within the loading guidelines discussed below. In those instances where passenger loads are as light as to require excessive time periods between vehicles in order to conform to loading guidelines, a policy-based headway should be used. The headways shown in the table below are an attempt to balance the transit rider's desire for frequent service with the operator's need to provide service in a cost-effective manner.

Table 3-4. Maximum Policy Headway

(Minutes between Buses)

Monday-Friday	**Urban**	**Suburban**	**Rural**
Peak (6 to 9 AM and 3 to 7 PM)	20	30	60
Midday (9 AM to 3 PM)	30	60	60 or cycle time
Early Morning / Evening (Start of service to 6 AM and 7 PM to end of service)	60	60	60 or cycle time
Saturday and Sunday	**Urban**	**Suburban**	**Rural**
Midday (8 AM to 7 PM)	30	60	60 or cycle time
Early Morning/Evening (Start of service to 8 AM and 7 PM to end of service)	60	60	60 or cycle time

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 11.

Transit services in Virginia's urban areas typically operate more frequently than in the state's suburban and rural areas. In rural areas, the interval between buses can be established at the cycle time, i.e., the time it takes for one bus to make a complete round trip on the route. Finally, the headways on routes with low frequency (wide headways) should be designed, whenever possible, to conform to regularly recurring "clock face" intervals (e.g., 9:10 AM, 10:10 AM, 11:10 AM, etc.). This method provides increased convenience.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable. **All of the current RADAR Transit routes operate on a round-trip cycle-time basis.** In some situations, these cycle times for a specific round trip by each bus assigned to a route are in excess of 1.5 hours (>90 minutes) due to the length of the route. However, these route-specific service frequencies are operated over the entire course of the day on those weekdays Monday through Friday when each route is in service. The college service routes are only offered on the weekends with cycle times of 1 hour (60 minutes). RADAR appears to meet the frequency of service guideline.

Span of Service. The Maryland MTA guidelines define "span of service" as the duration of time when service is "made available" and is measured from the earliest to the latest pick-up times during the day, as well as the days of the week the service is offered. Considerations noted earlier for the frequency of service, such as the desires of transit riders and the financial capability of the transit service provider, apply to the span of service guidelines as well.

Table 3-5. Span of Service

(Start and End Times)

Day of Week	**Urban**	**Suburban**	**Rural**
Weekday	5 AM to 1 AM	5 AM to 10 PM	5 AM to 10 PM
Saturday	5 AM to 1 AM	5 AM to 10 PM	5 AM to 10 PM
Sunday	5 AM to 1 AM	5 AM to 10 PM	As needed

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 12.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable.

The RADAR fixed-route services presently operate only Monday through Friday, with typical hours of operation between 6:00 AM and 6:00 PM (PART route) and 8:00 AM and 6:00 PM (Clifton Forge – Covington route). This 10 to 12-hour duration average service day is somewhat less than the MTA suggestion of a 17-hour span of service. **Considering the low density and rural nature of the areas served by these two routes as well as the limited employment and commercial opportunities generally available after about 6:00 PM; the current RADAR fixed-route span of service appears to be reasonable and appropriate.** The college routes are special weekend routes run for the convenience of local students with a limited schedule so as to be financially practicable.

Loading Guidelines. This guideline refers to the number of people on board a transit vehicle at a single point of time. It is measured as the ratio of passengers on board to the seated vehicle capacity, and it is expressed as a percentage. To ensure that passengers will be able to obtain seats on transit vehicles for at least a major portion of their trips, loading guidelines must be established and schedules devised so that passenger volumes conform to the guidelines. Values at, or less than, 100 percent indicate that all riders have a seat. Values greater than 100 percent indicate that some passengers are standing for at least a portion of the trip. Loading standards indicate the acceptable number of standees with consideration given to both the operating period and the service area type.

Table 3-6. Maximum Load Factors

Time Period	Urban	Suburban	Rural
Peak (6 to 9 AM and 3 to 7 PM)	120%	110%	100%
Off-peak	100%	100%	100%

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 13.

The guidelines shown in the table above allow for some standees only during the peak periods on urban or suburban transit operations. In the case of rural and small urban area transit operations, particularly those using smaller size vehicles, route planning and design principles should not anticipate any standees. In addition, due to safety concerns, it is recommended that standees not be permitted on roadways with a posted speed limit of 55 mph or higher.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable. **RADAR fully satisfies this service guideline by requiring all passengers to wear seatbelts at all times on the vehicles and not allowing standees on any trip.**

Service Availability and Bus Stop Spacing. These transit service guidelines relate to both the availability of the transit system to potential customers as well as the spacing of bus stops along a transit route.

- *Service Availability* – In the course of evaluating both existing services and proposals for new transit services, the transit system operator must determine whether or not a specific location is "served" by the transit system, thus determining whether or not the transit service is available at that location. The standard guideline in this regard is that a location should be considered to have service only if it is within a ¼ mile walking distance to a bus stop.

- *Bus Stop Spacing* – While route alignments are the primary determinants of transit availability, a second influence on the proximity of transit is the bus stop spacing along those routes. As stated above, the key measure of the ability to access the transit system is the walking distance to the nearest bus stop. Obviously, stops at every intersection provide the shortest walking distance to the bus. However, this would adversely affect vehicle speed and trip times for patrons already riding the bus. For this reason, the placement of bus stops along transit routes requires balancing passenger convenience and speed of operation.

Bus stop spacing should also reflect the characteristics of the area being served. In some cases, the bus stop spacing guidelines should be disregarded in favor of simply considering the locations of patron concentration. This is especially true at certain commercial and high-density residential areas.

Table 3-7. Bus Stop Spacing

Measure	Downtown Core	Urban	Suburban	Rural
Bus stops per mile	10 to 12	5 to 10	4 to 6	As needed
Typical spacing (feet)	450	750	1,000	As needed

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 14.

In the case of a rural, small urban area bus system such RADAR, the rural service guidelines developed by the MTA are most applicable.

The bus stop locations along the RADAR routes appear to be located on the basis of the identified major transit demands of the service areas. Most of the stops are located near the entrances of business concentrations, shopping centers and transit-dependent locations such as public schools and hospitals. Those stops located in the more developed residential areas of the various towns appear to be spaced appropriately near street corners. All of the regular stops in the towns which are designated as time points on the public route schedules appear to be designated by bus stop signs. Some, but not all, of those stops in the surrounding counties and smaller communities which are designated time points on the route maps and schedules are also designated by bus stop signs.

Overall, it appears that the bus stop spacing guideline is being satisfied at this time. However, consideration should be given in the future to the installation of additional bus stop signs at all of the designated time points on the individual route schedules.

Directness. In order for any public transportation system to attract a substantial number of riders, transit services must be able to provide a reasonably direct trip. If a trip by public transportation is long and circuitous, riders may find an alternative mode of transportation and potential riders may be discouraged. In contrast, a more direct transit route will be considered more convenient, thereby attracting riders. As shown on the table below, the guidelines indicate that a transit trip should take no more than an hour and should not take more than twice as much time as the identical trip by automobile. The maximum scheduled time for any transfer is 15 minutes.

Table 3-8. Transit Travel Time

Measure	Urban	Suburban	Rural
Maximum trip length with transfers (minutes)	60	60	60
Maximum transit/automobile time ratio	2:1	2:1	2:1
Maximum schedule time for any transfer (minutes)	15	15	15

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 15.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable.

Most of the current RADAR fixed route riders do not appear to need to transfer from one route to another in order to get to their desired destinations. For them, the transit service is the most direct service. The scheduled times from end to end of each of the routes operated by the system are typically no more than 60 to 90 minutes. Based on the distances and service areas of the routes operated by RADAR, the travel times by transit appear to be somewhat similar to the travel time by automobile. **The transit/automobile time ratio thus appears to be reasonable and appropriate for this system, and this service guideline is being satisfied.**

Dependability. Transit agencies must provide the transit patron with a reasonable guarantee that the scheduled service will operate and function according to the published timetable. This guideline gauges whether transit service is operated as scheduled and whether or not the transit trip is operated at all. The dependability of the transit service is important to people who typically plan trips around the availability of the service. Moreover, riders associate a time penalty with unreliable transit service, which reduces the attractiveness of public transportation.

Dependability of transit service is typically measured in two ways: *schedule adherence* and *trip availability*. The first is a measure of how closely the service conforms to the established and published schedule. The second is the percentage of scheduled service that fails to operate (i.e., missed trips). These two criteria are each summarized in the accompanying tables.

Schedule Adherence – Schedule adherence measures the difference between scheduled times and the time the vehicle actually passes a particular location. The schedule adherence service guideline consists of two parts: (1) the definition of "on-time" and (2) the proportion of buses that operate within the "on-time" range. "On-time" is defined here as zero minutes early to five minutes late. This allows the bus reasonable latitude for encountering general delays without unduly inconveniencing the waiting patron. Vehicles should never be early, since this would cause patrons to miss the bus entirely, and often subjects riders to an excessive wait for the next scheduled bus. The "on-time" percentage for this service guideline is 85 percent. The on-time performance can be measured from the route terminals, time points along the route, or at points where the route intersects with other transit routes:

Table 3-9. Schedule Adherence

Measure	Urban	Suburban	Rural
Definition of "on-time" (minutes)	0 early/5 late	0 early/5 late	0 early/5 late
Percent on-time	85%	85%	85%

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 16.

Trip Availability – It is inevitable that difficulties will occur occasionally that will disrupt operations and require trips to be cancelled. While at times delays cannot be avoided, the transit operator should take steps to ensure that they are not compounded by preventable disruptions in bus service. In terms of the allowable disparity between the service scheduled and operated, this guideline has been established at 0.5 percent, which permits only one trip in 200 to be missed. In view of the frequency of service operated in many rural and small urban areas, as well as the possible need to transfer between buses to complete many trips, a rigorous guideline is appropriate:

Table 3-10. Trip Availability

Measure	Urban	Suburban	Rural
Missed trips	0.5%	0.5%	0.5%

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 16.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable.

The "on-time" performance rate of RADAR appears to be generally acceptable. The feedback of bus "on-time" performance by passengers as part of the on-board ridership survey described in a previous section of this chapter indicated that passengers gave RADAR a good rating for this performance. About 83 percent of the passengers on the fixed route services were satisfied with the system's "on-time" performance. **Although the system does not regularly monitor on-time performance along each route, the results of the on-board survey, combined with gathered information appears to indicate that the general "on-time" performance rate of RADAR is better than 85 percent.** A more regular process of monitoring on-time performance

on all of the routes operated by the system should be implemented in the future, with GPS systems in the busses.

The transit services provided by RADAR also appear to be very consistent. The transit system always follows the published bus schedules to provide the services, weather permitting. **Based on information provided by the transit system personnel, it would appear that the "trip availability" service guideline is being satisfied at this time.** A more formal process of monitoring this factor should be implemented in the future.

Financial. This criterion specifies acceptable values for system farebox recovery, which is the ratio of revenue to operating cost expressed as a percentage. To assure consistency with other related DRPT legislation and operating guidelines, revenue includes fares paid by patrons along with ancillary revenue such as advertising.

Farebox recovery is a measure that provides transit agencies with a broad gauge of the financial condition of the transit system. The suggested guidelines for public transit systems in Virginia vary by the service area type. The range of 10 to 40 percent for total revenue and 5 to 20 percent for passenger revenues reflect the increased intensity of transit system use in larger and more densely-populated urban areas.

Table 3-11. Financial Guidelines

Measure	Urban	Suburban	Rural
System farebox recovery (total)	40%	20%	10%
Passenger fares	20%	10%	5%

Source: Adapted from Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 17.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable.

The revenue for RADAR fixed-route service includes passenger fares and local operating assistance. Based on the latest available system operating statistics of RADAR for FY2008, the annual passenger fare revenue was $6,532 for the fixed route system (see Appendix D for summary table). This value represents about 4.9 percent of the total reported system annual operating cost of $134,628. Local operational funds totaled $48,031. **This value generated solely by RADAR system farebox recovery is above the 10 percent figure cited in the table above for the full system farebox recovery value inclusive of both passenger fares and other operational revenues.**

It is also acknowledged that the local governments who support RADAR appear to view this as a valuable local public service. The local providers have been willing to fund the necessary operating assistance funding to maintain and modestly expand the service since its initiation.

Productivity. The most useful measure of a public transportation system's productivity is passengers per revenue hour. It measures the number of passengers who, on average, board a

transit vehicle for every service hour the vehicle is operated. This is a useful measure because it provides the operating agency with a method to measure service without focusing on operating costs. Similar to the farebox recovery ratio, this service guideline for transit systems in Virginia will vary by the service area type. This reflects the increased intensity of transit system use in larger and more densely populated urban areas.

Table 3-12. Productivity

Measure	Urban	Suburban	Rural
Passengers per revenue hour	20	10	5

Source: Maryland Transit Guidelines, Maryland Transit Administration, May 2002, Page 17.

In the case of a rural, small urban area bus system such as RADAR, the rural service guidelines developed by the MTA are most applicable.

Based on the latest available system operating statistics for RADAR for FY2008, the number of annual passenger is 13,249 and the annual revenue hours are 2,484 for the whole system. The associated value of passengers per revenue hour for the entire system is 5.33.

This value is greater than the value of 5 shown in the table above and appears to meet the productivity guideline.

3.8 Potential Solutions to Gaps or Service Deficiencies

RADAR's strategic plan completed in 2007 identifies potential expansion in Alleghany Highlands, Bedford, and the City of Lexington areas. Although feasibility studies have been completed for the Bedford and Lexington routes, the concern over the long-term stability of State operating assistance funding coupled with the lack of a local funding partner make it unlikely that any expansion will be undertaken in the near future.

Increased service to existing routes appears to be a need of the system; however, without increased funding for more busses and drivers it is unlikely to occur in the near future.

3.9 Proposed Remedies for Equipment and Facility Deficiencies

Since the initiation of service in 1975, RADAR Transit has been successful in both acquiring the vehicles required to operate its service on a regular basis and in obtaining Federal, State, and local government operating assistance. The current location of RADAR's principal administration, dispatch, and maintenance facility meets all of the system's needs and offers the opportunity for future expansion. However, upgrades to the employee parking area and the provision of additional security lighting and surveillance systems for the outside vehicle storage area would be helpful. In addition computer upgrades to better facilitate dispatch and GPS tracking systems for all busses are being proposed.

3.10 Title VI Report and FTA Quadrennial Review

As a designated subrecipient of FTA capital and operating assistance funding through the Virginia Department of Rail and Public Transportation (DRPT) whose services are provided in both urban and rural portions of the Commonwealth, RADAR is not required to prepare and submit its own separate Title VI report or the associated FTA Quadrennial Review. The statewide Title VI Report and Quadrennial Review prepared by DRPT satisfy this FTA requirement, and it was last completed on December 9, 2008.

RADAR is required to follow the Title VI and Title VI-dependent guidelines for Federal Transit Administration recipients as described in FTA Circular C 4702.1A. Thus, for example, the appropriate provisions of the NEPA process were followed in connection with the planning, design, and construction of the new Roanoke transit operations and maintenance center. Similarly, all official publications issued by RADAR Transit include appropriate language concerning non-discrimination.

4.0 SERVICE EXPANSION PROJECT DESCRIPTIONS

The purpose of this chapter of the TDP is to present a description of potential service and facility improvement needs over the multi-year duration of the transit plan. These needs should be viewed not as a "wish list" but rather as documentation of those reasonable potential actions to improve the existing transit system from how it exists today to what it might look like five to seven years into the future. The contents of this chapter include the following elements:

- Demographic analysis that identifies anticipated changes in population and employment within the service area.

- A description of potential needs based on the work undertaken to date in connection with the TDP development. This discussion reflects inputs from the transit agency staff, other regional stakeholders, and the technical analysis undertaken by the members of the consultant team.

- Preliminary capital and operating cost estimates associated with each of the various identified potential needs and a discussion of potential policy, funding, or operating issues associated with the defined needs. This data will include estimates of potential ridership response to the various service improvements.

Each of these topics is discussed in more detail below.

4.1 Demographic Analysis of Anticipated Population and Employment Changes

The RADAR service area includes portions of four counties and six urban centers around the southern portion of the Shenandoah Valley. The area is predominantly rural in nature, with the exception of a number of cities (Roanoke, Salem, Covington, Clifton Forge, Martinsville, etc.) which house concentrations of population and employment. As shown in **Table 4-1,** the estimated present day population of the RADAR service area (based on 2008 Census data) is approximately 334,390 persons, spread across a total land area of about 1,916 square miles. The resulting average population density is approximately 175 persons per square mile. The more densely populated portions of the region are composed of the Roanoke, Salem, Martinsville, Clifton Forge, and Covington urban areas. It should be noted that the actual service area population is somewhat less than the population total for the area because the service area and routes do not cover all of the land area in each county. Additionally, three other DRPT recognized public transit service providers provide service in various parts of the defined service area.

Two regional Planning District Commissions, the Roanoke Valley – Allegheny Regional Commission (PDC 5) and the West Piedmont Planning District Commission (PDC 12), are contained in the limits of the RADAR service area. The Roanoke Valley – Allegheny Regional Commission jurisdictions contain the majority of the service area population, approximately 230,000 persons, or about 70 percent of the total; and the West Piedmont PDC area contains the approximately 104,000 (30 percent) remaining population.

Recent estimates assembled by the Virginia Employment Commission show that in 2009, the total employment within this multi-county service area was approximately 165,200 jobs. As shown in **Table 4-1**, about 112,200 (68%) of the jobs were located in the Roanoke Valley – Allegheny Regional Commission jurisdictions. Likewise, approximately 52,900 (32%) of the total regional employment base is found in the West Piedmont PDC. These anticipated population and employment increases do not guarantee increased ridership for RADAR; however, realignment of services and routes to areas seeing this growth could result in higher levels of ridership.

Table 4-1. Present Day Population and Employment Summary

	2000 Population	2008 Population Estimate	County Area (Sq. Miles)	2000 Population Density (Persons/Sq. Mi.)	2008 Population Density (Persons/Sq. Mi.)	2009 Employment
PDC 5 - Roanoke Valley -Alleghany Regional						
Roanoke Valley						
Roanoke County	85,778	90,867	250.87	341.92	362.21	46,877
Salem	24,747	25,449	14.59	1696.16	1744.28	12,740
Roanoke City	94,911	91,552	42.00	2259.79	2179.81	43,739
Alleghany/Highlands						
Alleghany County	12,926	16,202	444.63	29.07	36.44	6,436
Clifton Forge	1,657	N/A	N/A	N/A	N/A	N/A
Covington	6,303	6,120	5.67	1111.64	1079.37	2,454
PDC 12 - West Piedmont Planning District Commission						
Franklin County	47,286	51,477	692.08	68.32	74.38	25,047
Martinsville City	15,416	14,543	10.96	1406.57	1326.92	5,091
Henry County	57,930	38,180	455.24	127.25	83.87	22,807
Total Study Area	**346,954**	**334,390**	**1916.04**	**181.08**	**174.52**	**165,191**

Sources: 2000 Census for population, Virginia Employment Commission for employment data
2008 Population Estimates - http://quickfacts.census.gov/qfd/states/51/51036.html
2009 Employment Data (Average: January – June 2009) - Virginia Employment Commission

Information obtained from the Virginia Employment Commission presents future year forecasts of population for each of the four counties and five of the six cities in the RADAR service area for the years 2010, 2020, and 2030. For the purposes of the RADAR TDP, a future plan horizon year of 2015 has been identified, six years from the current base transit operations year of 2009. **Table 4-2** presents estimates of future population for the years 2010, 2015, 2020, and 2030 for the RADAR service area. The 2015 estimates represent the mid-point of the 2010 and 2020 estimates.

Table 4-2. Future Year RADAR Service Area Population Estimates (All Ages)

Counties	2000	2010	2015	2020	2030	Change, 2010-2015 Number	Change, 2010-2015 Percent
PDC 5 - Roanoke Valley -Alleghany Regional							
Roanoke Valley							
Roanoke County	85,778	92,357	95,703	99,048	105,889	3,346	3.6%
Salem	24,747	24,293	24,219	24,145	24,143	-74	-0.3%
Roanoke City	94,911	90,327	89,415	88,503	88,495	-912	-1.0%
Alleghany/Highlands							
Alleghany County	12,926	16,287	16,105	15,922	15,920	-182	-1.1%
Clifton Forge	1,657	NA	NA	NA	NA	NA	NA
Covington	6,303	6,055	6,003	5,952	5,946	-52	-0.9%
PDC 12 - West Piedmont Planning District Commission							
Franklin County	47,286	52,406	54,877	57,347	62,443	2,471	4.7%
Martinsville City	15,416	14,376	14,164	13,952	13,954	-212	-1.5%
Henry County	57,930	54,483	53,731	52,979	52,977	-752	-1.4%
Total Study Area	**346,954**	**350,584**	**354,217**	**357,848**	**369,767**	**3,633**	**1.0%**

Source: 2000 Census and Virginia Employment Commission Community Profiles for each county.
** = Not an estimate*

As **Table 4-2** shows, the RADAR service area counties are projected to have an overall increase in population from 2010 to 2015. This increase is the result of significant population growth projected to occur in Franklin and Roanoke Counties. The remainder of the service area, primarily in the urban centers, is projecting slight population losses on the order of about one percent between 2010 and 2015. For the overall RADAR service area, the total estimated net population increase is projected to be approximately 3,633 persons from 2010 to 2015 or a change of 1.0 percent. On an average annual basis, this value amounts to approximately 0.2 percent per year.

Table 4-3 illustrates the current and projected future service area population of those persons age 65 or older.

Table 4-3. Estimated Population of Elderly Persons (65 or Older)

Counties	2000	2010	2015	2020	2030	Change, 2010-2015 Number	Change, 2010-2015 Percent
PDC 5 - Roanoke Valley -Alleghany Regional							
Roanoke Valley							
Roanoke County	13,645	15,209	17,816	20,423	24,581	2,607	17.1%
Salem	4,148	4,272	4,809	5,346	5,978	537	12.6%
Roanoke City	15,560	13,632	14,325	15,018	16,819	693	5.1%
Alleghany/Highlands							
Alleghany County	2,025	2,975	3,182	3,388	3,845	207	7.0%
Clifton Forge	1,657	NA	NA	NA	NA	NA	NA
Covington	1,274	1,210	1,286	1,361	1,513	76	6.3%
PDC 12 - West Piedmont Planning District Commission							
Franklin County	6,765	8,963	10,463	11,964	14,767	1,500	16.7%
Martinsville City	3,179	3,295	3,489	3,682	4,309	194	5.9%
Henry County	8,692	9,299	9,811	10,323	11,894	512	5.5%
Total Study Area	**56,945**	**58,855**	**65,181**	**71,505**	**83,706**	**6,326**	**10.7%**

Source: 2000 Census and Virginia Employment Commission Community Profiles for each county.
** = Not an estimate*

As shown in **Table 4-3 and Figure 4-1**, the population of elderly persons is projected to increase from 2010 to 2015 in all parts of the RADAR service area. For the overall RADAR service area, the total number of elderly persons is projected to increase from about 58,900 persons in 2010 to about 65,200 persons in 2015. This 6,300 person increase in elderly residents represents about an 11 percent increase or about a 2 percent increase per year. As stated previously, the service area for RADAR does not cover the entire area for each of the counties and cities presented; therefore, it would be unwise to infer a significant increase in ridership as a result of strictly the projected elderly population growth. However, these increases, if in the area of existing or future service, would likely result in a ridership increase of some level. Likewise, identifying where the elderly and other population growth is likely to occur would be important for identifying modifications to existing service or potential new service routes.

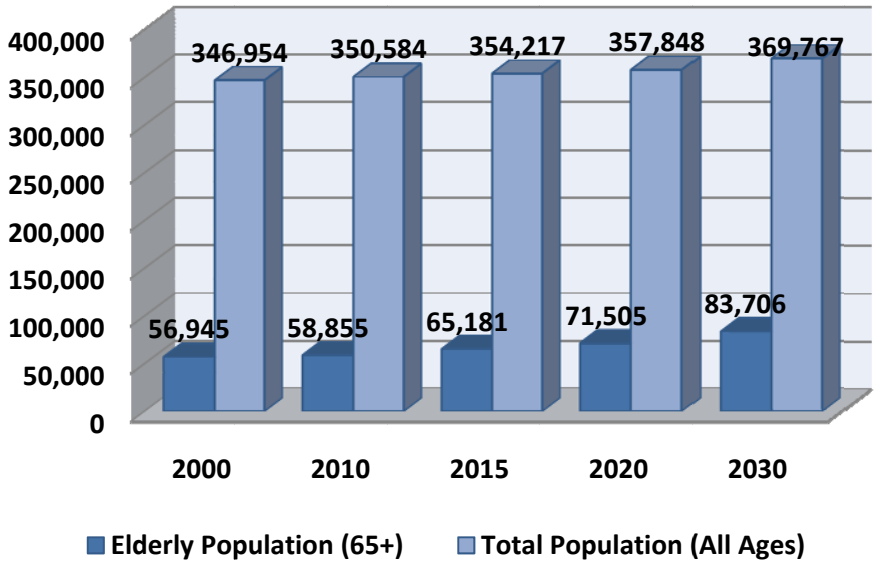


Figure 4-1. Projected Population (All RADAR Service Jurisdictions)

4.2 Potential Service Expansion and Facility Needs

The starting point for the definition of any potential service expansion or facility needs is the existing public transportation system being examined, in this case RADAR. As described in previous sections of this TDP document, RADAR has been a steadily growing and expanding system since its inception in 1975.

Currently, RADAR operates a group of three fixed express routes, two deviated fixed routes, and two demand response service areas with a current system operating budget of $302,582 per year (2008 fiscal year) for the public transit portion of its operation. The system generated 21,817 trips in 2008 that produced approximately $14,900 in fare revenue. Current rates for the system include $2.66 per revenue mile and $46.64 per revenue hour (see **Appendix D** for summary table). Assuming a two percent inflationary cost increase per year and 0.2 percent ridership growth per year, the following projections can be made:

No Change in Service for Next Five Years: **Table 4-4** presents this scenario, which assumes no change in the type or location of the current services, no change in the number of operating hours, and no new sources of passenger growth beyond the previously cited modest projected growth in population. The capital expense for vehicle replacement is based upon a $55,000 per vehicle average replacement price for FY2009 and FY 2010 (as Federal ARRA funding will provide two buses in FY2010).

Service Expansion/Growth Scenarios: Based upon conversations with RADAR officials, it is unlikely that any expansion to the system will be seen in the upcoming five year window. RADAR believes it will be strained to keep its existing service with continuing reductions in all forms of funding and increasing operational costs. **The only potential system growth**

envisioned would be that associated with an increase in the vehicle fleet, resulting in the ability to provide an increased frequency of service. However, there is not, at this time, a committed funding mechanism in place for the coverage of increased system operating costs. Therefore, no definitive plan to expand the vehicle fleet exists at this time.

In their currently adopted strategic plan, RADAR has identified the potential development of routes in the Bedford and Lexington areas. Some level of feasibility study has been completed by Ride Solutions for these services; however, there is currently no local sponsor ready to help fund there services. As a result, RADAR has made no definitive plan for the expansion of services in these areas during the next five years.

Increased service frequency on the recently initiated Martinsville/Henry County bus route has been discussed as well. This change may occur if federal stimulus funding is made available for capital expenditures, including vehicle purchase, and if additional federal, state, and local government operating assistance funding can be provided.

Facility Needs: In late 2008, RADAR finished installing an upgraded scheduling and dispatching system that incorporates GPS equipment on all vehicles. This program, Mentor, is a fleet management system that provides route match services as well as onboard vehicle data terminals. The upgraded system would improve efficiency, safety of the system, and also be helpful in assessing several of the performance criteria presented in Chapter 3. RADAR would like to incorporate this upgrade in all future bus purchases. Discussions have been made to upgrade/expand this computer system to coordinate with the GPS units likely to be installed on new bus purchases. As stated previously, there is no committed funding in place for this improvement and no definitive plan for the upgrade to the computer system is in place.

RADAR is also considering the installation of security cameras in the busses. These cameras would also work in conjunction with the upgraded vehicle GPS system to increase passenger safety. As stated previously, RADAR is reapplying for funding for this upgrade in late summer 2009, but there is no committed funding in place for this improvement and no definitive plan for the installation of these security cameras is in place. Improvements to the employee parking area and improved security at the transit center are also slated for the future.

The fundamental question facing RADAR is how best to improve upon the current system. One of the basic needs is the continuation of the transit vehicle replacement and fleet expansion. This activity will continue as long as the system is in operation.

In recent years, RADAR has typically acquired four to six vehicles in any given year, an average of five vehicles each year. The projected vehicle replacement cycle is presented in **Table 4-4** through the TDP horizon year of 2015. Fiscal year 2010 and beyond, vehicle replacement numbers are taken from DRPT's Draft Fiscal Year 2010 Rail and Public Transportation Improvement Program, and this document includes vehicles purchased for the Martinsville/Henry County Route.

The replacement cost values in Table 4-4 include an annual inflation rate of 2.0 percent. This increase would change the average $55,000 vehicle replacement cost (FY2010) to approximately $60,700 by the year 2015 (rounded to the nearest $100). The total estimated cost of acquiring an average of five vehicles each year for a period of the next six years would be approximately $1.9 million.

Table 4-4. Estimated Costs Projected for RADAR (No Action Scenario), FY2009-FY2015

	FY2009*	FY2010**	FY2011**	FY2012**	FY2013**	FY2014**	FY2015**
Operating Budget	$308,400	$522,200	$532,600	$543,300	$554,200	$565,200	$576,500
Passenger Trips	21,900	31,900	31,900	32,000	32,100	32,100	32,200
Fare Revenue	$15,000	$28,500	$28,600	$28,600	$28,700	$28,700	$28,800
Annual Mileage	$0.68	$0.89	$0.90	$0.89	$0.89	$0.89	$0.89
Annual Hours of Service	6,500	11,000	11,000	11,000	11,000	11,000	11,000
Cost per Revenue Mile	113,900	192,900	192,900	192,900	192,900	192,900	192,900
Cost per Revenue Hour	$47.45	$47.47	$48.42	$49.39	$50.38	$51.38	$52.41
Estimated number of new buses	4	5	5	5	4	6	4
Estimated Capital Cost (buses)	$220,000	$275,000	$280,500	$286,100	$233,500	$357,200	$242,900

- *Values have been rounded to nearest hundred.*
  ** - FY2009 total does not include cost associated with the Martinsville/Henry County Demonstration Project.*
- *** - Higher values for FY 2010 onwards include revenues and additional assistance associated with the Martinsville/Henry County Route.*
- *FY2010 Operating Cost obtained from DRPT FY2010 district budget data. Beginning in FY2011, the Annual Operating Cost calculated assuming a 2.0%/year inflation rate.*
- *Annual Revenue Miles assumed to be constant through the life of the TDP period.*
- *Annual Revenue Hours for FY 2009 provided by RADAR Transit and assumed to be constant through the life of the TDP period.*
- *FY2010 Passenger Fare and Contract Revenue Total obtained from DRPT FY2010 district budget data and assumed to be constant through the life of the TDP period.*
- *Federal Operating Assistance reflects estimated FTA Section 5311 and FTA 5316 funds; assumed to remain flat at FY2010 levels.*
- *FY2010 State Operating Assistance obtained from DRPT FY2010 district budget data. The increase in State Operating Assistance, as per DRPT, is assumed to be 1.77% in FY2011, 2.90% in FY2011-FY2012, 3.50% in FY2012-FY2013, 3.16% in FY2013-FY2014, and 3.16% in FY2014-FY2015.*

Table 4-5 illustrates the anticipated operating statistics and operating assistance funding levels associated with the continuing operation of RADAR at present day service levels. The table does not include Job Access and Reverse Route (JARC) service; however, it does include the new service provided in the Martinsville/Henry County area beginning for FY 2010. These tables

assume that the fiscal year 2010 vehicle miles and hours of service would remain basically unchanged over the next several years, with the anticipated increase in service area population defining the magnitude of the anticipated passenger growth. Operating expenses are assumed to experience an average annual increase of approximately 2.0 percent over the period through 2015. Federal funding will remain fixed at FY2010 values, and State funding, as per DRPT direction, will increase over the FY 2010 level by 1.77% in FY 2010-FY 2011, 2.90% in FY 2011-FY 2012, 3.50% in FY 2012-FY 2013, 3.16% in FY 2013-FY 2014, and 3.16% in FY 2014-FY 2015.

As can be seen in the table, local funding for the transit service would need to increase from approximately $169,000 to $211,000 to maintain existing service. This represents an increase of nearly 25 percent, or approximately 4.5 percent annual increase over the life of the TDP to make up for anticipated funding shortfalls.

Capital vehicle costs on the table are assumed to have a two percent unit cost increase per year after FY2010. Vehicle replacement per year is taken from DRPT's long range capital budget for RADAR and assumes no increased service.

Table 4-5. System Revenues and Operating Assistance of RADAR FY2008-FY2015 (No Growth Scenario)

System Revenues and Operating Assistance	FY2008	FY2009 *	FY2010 **	FY2011	FY2012	FY2013	FY2014	FY2015
Passenger Fares	$14,900	$15,000	$28,500	$28,600	$28,600	$28,700	$28,700	$28,800
Local Operating Assistance	$96,700	$98,600	$169,000	$178,000	$186,300	$194,200	$202,600	$211,100
State Operating Assistance	$47,100	$48,100	$77,900	$79,300	$81,600	$84,400	$87,100	$89,800
Federal Operating Assistance	$143,800	$146,700	$246,800	$246,800	$246,800	$246,800	$246,800	$246,800
Totals	$302,600	$308,400	$522,200	$532,600	$543,300	$554,200	$565,200	$576,500

- **- FY2009 values do not include cost associated with the Martinsville/Henry County Demonstration Project.*
- *** - Higher values for FY 2010 onwards include revenues and additional assistance associated with the Martinsville/Henry County Route.*
- *FY2010 Operating Cost obtained from DRPT FY2010 district budget data. Beginning in FY2011, the Annual Operating Cost calculated assuming a 2.0%/year inflation rate.*
- *Federal Operating Assistance reflects estimated FTA Section 5311 and FTA 5316 funds; assumed to remain flat at FY2010 levels.*
- *FY2010 State Operating Assistance obtained from DRPT FY2010 district budget data. The increase in State Operating Assistance, as per DRPT, is assumed to be 1.77% in FY2011, 2.90% in FY2011-FY2012, 3.50% in FY2012-FY2013, 3.16% in FY2013-FY2014, and 3.16% in FY2014-FY2015.*

5.0 SERVICE AND FACILITY RECOMMENDATIONS

The purpose of this chapter of the TDP is to identify service and facility needs that are recommended for inclusion over the multi-year duration of the transit plan. A more comprehensive listing of potential services and facility needs were identified in the prior chapter of this TDP. Recommended service and facility improvements that are presented in this chapter are based on the anticipated funding availability levels during the TDP time period.

Where sufficient federal, state, and local funding has been identified for either the estimated capital or operating costs associated with a specific recommendation, the activity has been categorized as achievable under the fiscally "constrained" transit development plan. Where a substantial portion or the total required amount of estimated capital or operating costs for a specific action cannot be easily identified, the activity has been identified as being in need of additional funding and has been considered to be achievable only under the fiscally "unconstrained" transit development plan. This label does not mean that the action cannot be accomplished during the six-year TDP cycle ending in FY2015, but rather that additional sources of federal, state, or local funding beyond those currently anticipated to be available to RADAR will need to be identified and committed to the specific project.

5.1 Service Recommendations

Chapter 4 of this TDP identified limited opportunities for service improvements for RADAR over the TDP's six-year time period of FY2010 to FY2015 in addition to the continuation of the current level of operations. These options included:

- Increased frequency for the Martinsville and other established RADAR routes.
- The initiation of fixed-route service in Lexington.
- The initiation of fixed-route service in Bedford.
- Service to other outlying areas within one hour of travel of Roanoke.

As was noted in Chapter 4, there is a basic lack of funding both on a Federal and State level to realistically implement these service improvements/expansions without extensive contributions from the local governments or business partners.

Taking into consideration RADAR's current financial condition and anticipated funding levels in the near-term future, it appears to be unlikely that they would be able to afford to initiate the new fixed-route services. As was described in Chapter 3, the total annual revenues (Passenger Fares and Contract Revenues) generated by RADAR's fixed-route service operations in FY2008 represented only about five percent of the total annual operating costs. The remaining net operating costs were funded during that year through a combination of local government (about 34%), state government (about 16%), and federal government (about 50%) funds (see **Appendix D**). Because of the recent economic downturn, it is expected that the local

government tax base will not be growing at a significant rate. In addition, future federal and state funding levels are somewhat uncertain at this point, with the level of state operating assistance support having recently experienced a reduction in funding.

Therefore, it is suggested that RADAR's top priority as defined in this TDP be a focus on maintaining the current demand-response and fixed-route/fixed-schedule service levels in the near-term. The proposed increase in service frequency through the use of a larger fleet and the initiation of two new fixed-route services should thus only be considered an element of the "unconstrained" TDP program of projects. Should additional operating assistance funds become available from federal, state, or local sources, one or more of these three service changes could be designated as an element of the "constrained" TDP program of projects.

5.2 Facility Recommendations

Chapter 4 of this TDP also identified several potential facility improvements for consideration over the TDP's six-year time period. The improvements were shown as follows:

- Existing operating vehicle acquisition / replacement as vehicles reach the end of their designated useful life.
- Upgrading Computerized Scheduling and Dispatching System.
- Security cameras on busses.

Existing Operating Vehicle Acquisition / Replacement: The American Recovery and Reinvestment Act (ARRA) has identified RADAR as one of the rural and small urban public transit systems in Virginia to receive Federal Recovery Act stimulus funding. Through this program, RADAR was identified as the recipient of two (2) replacement passenger transport vans at a total cost of $110,000. This allocation will take the form of 100 percent Federal funding with no state or local matching funds required. Therefore, it is expected that two (2) vehicles will be replaced for RADAR in FY2010 using the ARRA stimulus funding. In addition, assuming that during the TDP's six-year time period, the typical vehicle replacement schedule is continued, from FY 2009 to FY 2015, RADAR should be expected to be able to acquire about five (5) new/replacement vehicles each year. This historically observed vehicle replacement schedule is thus viewed as an element of the "constrained" TDP program of projects.

Upgrade Computerized Scheduling and Dispatching System: As described in Chapter 4 of this TDP, in late 2008, RADAR finished installing an upgraded scheduling and dispatching system that incorporates GPS equipment on all vehicles. This program, Mentor, is a fleet management system that provides route match services as well as onboard vehicle data terminals. This upgrade allows for greater efficiency and identification of problems. RADAR would like to incorporate this upgrade in all future bus purchases. Because this item is not currently identified in any of the funding scenarios reviewed, it should be defined as an element of the "unconstrained" TDP program of projects. Should additional funding assistance become available from federal, state, or local sources, this project could then be included as an element of the "constrained" TDP program of projects.

Installation of Security Cameras on Busses: RADAR is also considering the installation of security cameras in the busses. These cameras would also work in conjunction with the upgraded vehicle GPS system to increase passenger safety. As stated previously, RADAR is reapplying for funding for this upgrade in late summer 2009. Currently, there is no committed funding in place for this improvement and no definitive plan for the installation of these security cameras is in place; therefore, it is currently identified as an element of the "unconstrained" TDP program of projects. Should additional funding assistance become available from federal, state, or local sources, this project could then be included as an element of the "constrained" TDP program of projects.

Assuming the allocated capital funding from Federal and State governments and ARRA stimulus funding are all available for RADAR in the TDP's six-year time frame, the facility improvements recommended for implementation for each year are as follows:

FY2009 – Four (4) replacement vehicles

FY2010 – Five (5) replacement vehicles (two from ARRA stimulus funding)

FY2011 – Five (5) replacement vehicles

FY2012 – Five (5) replacement vehicles

FY2013 – Four (4) replacement vehicles

FY2014 – Six (6) replacement vehicles

FY2015 – Four (4) replacement vehicles

5.3 Other Recommendations

No other recommendations for RADAR have been presented at this time.

6.0 CAPITAL IMPROVEMENT PROGRAM

The purpose of this chapter of the TDP is to describe those capital programs (vehicles, facilities, and equipment) required to carry out the operations and services set forth in the TDP service and facility recommendations that were presented in the prior chapter.

6.1 Vehicle Replacement Program

As was noted in prior chapters of this TDP, RADAR has a fleet of 60 vehicles, of which 29 are DRPT or State funded. The majority are located in the Roanoke facility. The majority of the transit vehicles are diesel-powered; however, RADAR is gradually shifting towards gas-powered vehicles as a result of fuel costs and mechanical requirements. The passenger fleet primarily consists of 7 to 15 passenger handicapped accessible BOC vans; one bus can carry 19 passengers. Model years range from 2002 through 2008.

In recent years, Radar has typically acquired four to six vehicles in any given year, an average of five vehicles each year. These purchases represent both replacements for existing vehicles that have reached the end of their useful life and the acquisition of additional vehicles for the provision of expanded services. Two (2) vehicles to be obtained during FY2010 using Federal Recovery Act stimulus funding thus represent 40 percent of the system's recently observed typical vehicle acquisition / replacement cycle. This allocation will take the form of 100 percent Federal funding with no state or local matching funds required. Assuming that this typical vehicle replacement cycle is continued over the next several years through available funding from Federal, State, and Local governments, **Table 6-1** illustrates the total passenger fleet size and the anticipated average vehicle age between FY2009 and the TDP horizon year of FY2015.

Table 6-1. RADAR Fleet Replacement Program, FY2009-FY2015

Passenger Vehicle Fleet								
Model Year	**No. of Vehicles**	**FY2009**	**FY2010**	**FY2011**	**FY2012**	**FY2013**	**FY2014**	**FY2015**
2002	2	2	1	0	0	0	0	0
2003	6	5	3	2	0	0	0	0
2004	2	1	0	0	0	0	0	0
2005	6	6	6	6	4	3	0	0
2006	4	4	3	2	1	0	0	0
2007	1	1	1	1	1	0	0	0
2008	8	8	8	7	7	6	4	1*
2009	2	4	4	4	4	4	4	3*
2010	-	0	5	5	5	5	5	5*
2011	-	0	0	5	5	5	5	5*
2012	-	0	0	0	5	5	5	5*
2013	-	0	0	0	0	4	4	4*
2014	-	0	0	0	0	0	6	6*
2015	-	0	0	0	0	0	0	4*
Total Vehicles	29**	31	31	31	31	31	31	31
Avg. Age		3.1	3.0	3.2	3.0	3.2	3.0	3.2
Assumptions:	*Current fleet size remains relatively constant; 4 – 6 vehicles to be acquired each year starting FY 2009.* ** - 2015 exceeds replacement schedule given by RADAR and are only estimates.* *** - total does not include FY2009 numbers*							

6.2 Facility Improvement Program

Chapters 4 and 5 of this TDP also identified potential facility improvements for RADAR over the TDP's six-year time period. These improvements included the upgrade of a Computerized Scheduling and Dispatching System, installation of security cameras on transit busses, and improvements to the employee parking area and improved security at the transit center.

With no anticipated funding for any of these improvements, it is expected that these new projects could be implemented near the end of the TDP's six-year time frame in FY2014/FY2015.

7.0 FINANCIAL PLAN

The financial plan is a principal product of the TDP. It is in this chapter that an agency demonstrates its ability to provide a sustainable level of transit service over the TDP time period, including the rehabilitation and replacement of capital assets. This chapter identifies potential funding sources for annual operating and maintenance costs and the funding requirements and funding sources for bus purchases and other facility improvements.

7.1 Operating and Maintenance Costs and Funding Sources

Based on the latest budget information available from DRPT, RADAR's operating budget is proposed to be approximately $522,190 in FY2010. Funding sources for the proposed FY2010 operating budget was as follows:

- Federal Funds - $246,800 (47.3%)
- State Funds - $77,900 (14.9%)
- Local Government Funds - $169,000 (32.4%)
- Passenger Fares and Other Revenues - $28,500 (5.5%)

This TDP's financial plan begins with these costs and funding as the "base year" values for the estimation of future year operating costs and revenue streams. Annual O&M costs during the TDP time period are projected to grow from approximately $522,000 and in the FY2010 period to approximately $576,000 by FY2015. It is assumed that a two percent annual inflation rate is applied to these "base year" costs to estimate the annual O&M costs over the TDP time period.

In FY2010, the presently budgeted federal operating assistance fund level of $246,800 is projected to cover about 47 percent of RADAR's total annual net O&M costs. Federal operating assistance funds are assumed to remain at essentially a constant amount during the TDP time period. As stated previously, O&M costs are assumed to increase at a rate of about two percent each year due to inflationary factors. Therefore, this percentage is projected to decrease each year during the TDP time period.

The Virginia Department of State and Public Transportation (DRPT) has identified approximately $77,900 in state operating assistance for RADAR in FY2010 in its Transportation Improvement Program. The DRPT's TIP reflects a 19 percent growth state in operating allocations from its Mass Transit Trust Fund on a statewide basis between FY2010 and FY2015. The percentage increases in the anticipated annual state operating assistance are 1.77% in FY 2010-FY 2011, 2.90% in FY 2011-FY 2012, 3.50% in FY 2012-FY 2013, 3.16% in FY 2013-FY 2014, and 3.16% in FY 2014-FY 2015. The funding level will be increased by these percentage increases from the FY 2010 funding level (approximately $77,900) through the TDP time period.

State formula assistance grants for public transportation operating expenses are awarded on the basis of the total annual amount of state funds available expressed as a percentage of the total annual amount of transit operating expenses, subject to a cap of 95 percent of eligible expenditures. Eligible expenditures are defined as costs of administration, fuel, tires, and maintenance parts and supplies (payroll costs of mechanics and drivers are excluded). Projections for state operating assistance, as identified in the TDP financial plan, have been provided for planning purposes and may fluctuate up or down based on the aforementioned parameters.

State capital program grants from the Mass Transit Trust Funds (MTTF) are awarded to all public transportation capital projects deemed to be eligible, reasonable, and appropriate at a uniform level of state participation. The goal is to reach the maximum state share of capital expenses of 95 percent, but there have not been sufficient funds to support transit capital projects at this level since the Mass Transit Trust Fund was created in 1986. This level of participation or "state share" of capital project expenses is calculated by dividing the amount of state funds available for capital projects each year by the amount needed to support the non-federal share of all eligible transit capital projects for the year. Beginning in FY 2008, additional capital funds from the Transportation Capital Projects bond proceeds authorized under Chapter 896 of the 2007 Acts of Assembly have been available annually at a maximum state matching share of 80 percent in the Transit Capital Fund.

The estimated annual farebox and other revenues for RADAR are assumed to only increase with ridership growth between FY2010 and FY2015. This assumption reflects the very modest changes in service area population that are anticipated during this period. Ridership growth of no more than 0.2 percent each year is anticipated and there is no anticipated change in the annual revenue vehicle-hours of operation to be provided across RADAR service area.

Table 7-1 presents the TDP financial plan for the funding of the annual O&M costs through the TDP six-year time period. Using the assumptions identified for Federal and State operating assistance funding, the required local government funding requirements are anticipated to steadily increase through the TDP time period, from about $169,000 in FY2010 to about $211,100 in FY2015. As a percentage of the total estimated system operating costs, the local government share is anticipated to increase from about 32.4 percent of the total annual cost in FY2010 to about 36.6 percent of the total annual cost in FY2015.

Table 7-1. TDP Financial Plan for Funding Annual O&M Costs

(All Costs in Year of Expenditure Dollars)

TDP Financial Plan for: Service O&M Costs	**FY2009**	**FY2010**	**FY2011**	**FY2012**	**FY2013**	**FY2014**	**FY2015**
Annual Service-Hours	113,900	192,900	192,900	192,900	192,900	192,900	192,900
Projected O&M Costs	$308,400	$522,200	$532,600	$543,300	$554,200	$565,200	$576,500
Anticipated Funding Sources							
Federal	$146,700	$246,800	$246,800	$246,800	$246,800	$246,800	$246,800
State	$48,100	$77,900	$79,300	$81,600	$84,400	$87,100	$89,800
Farebox and Other Revenue	$15,000	$28,500	$28,600	$28,600	$28,700	$28,700	$28,800
Farebox Recovery Ratio	4.9%	5.5%	5.4%	5.3%	5.2%	5.1%	5.0%
Local Government Funding Required	$98,600	$169,000	$178,000	$186,300	$194,200	$202,600	$211,100
Local Government Funding Percentage	32.0%	32.4%	33.4%	34.3%	35.0%	35.8%	36.6%

Notes:

1. Projected O&M Costs assume a 2.0 percent/year inflation rate beginning in FY2011.

2. Federal funding reflects estimated FTA Section 5311 and FTA 5316 funds; assumed to remain flat at FY2010 levels.

3. State funding levels are known for FY2009 and FY2010. Table assumes state operating assistance is inflated (over previous year) at: FY11 = 1.77%, FY12 = 2.9%, FY13 = 3.5%, FY14 = 3.16%, FY15 = 3.16% levels.

4. Farebox revenues assume a constant fare structure.

7.2 Bus Purchase Costs and Funding Sources

As noted in Chapter 6 of this TDP, no service expansion has been proposed that would increase RADAR's bus fleet size. The bus purchases during the TDP time period are only for bus replacements. In FY2010, RADAR has been identified as the recipient of two replacement passenger transport vans at a total cost of $110,000 through ARRA funds. This allocation will take the form of 100 percent Federal funding with no state or local matching funds required. Assuming that the historically observed cycle of four to six vehicle replacements per year for RADAR is continued between FY2011 and the TDP horizon year of FY2015, the remaining bus purchases have been assumed to be funded through FTA's Section 5311 and 5310 Programs. Section 5310 funding allocation is 80 percent Federal and 20 percent Local, while Section 5311 funding is 80 percent Federal, 10 percent State, and 10 percent Local. For the bus purchase prices, a two percent annual inflation rate is applied beyond FY2010.

Table 7-2 presents the suggested TDP financial plan for funding bus purchases through the TDP six-year time period.

Table 7-2. TDP Financial Plan for Funding Bus Purchases
(All Costs in Year of Expenditure Dollars)

	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Bus Replacements	4 buses	5 buses	5 buses	5 buses	4 buses	6 buses	4 buses
Bus Replacement Costs	$220,000	$275,000	$280,500	$286,100	$233,500	$357,200	$242,900
Anticipated Funding Sources							
Federal-ARRA	$0	$110,000	$0	$0	$0	$0	$0
Federal-FTA5310 Program	$132,000	$0	$134,600	$0	$140,100	$0	$145,700
Federal-FTA5311 Program	$44,000	$132,000	$89,800	$228,900	$46,700	$285,800	$48,600
State	$5,500	$16,500	$11,200	$28,600	$5,800	$35,700	$6,100
Local Government Funding Required	$38,500	$16,500	$44,900	$28,600	$40,900	$35,700	$42,500

Notes:
1. Bus replacements by year identified in Chapter 6 of TDP.
2. Bus replacement costs assumed to be about $55,000 in current year (FY2009 and FY2010) dollars.
3. Table reflects 2.0% per year inflation in bus acquisition costs.
4. Two (2) of the FY2010 buses being acquired through the use of ARRA funding.
5. Assume 5310 funding for 3 busses every second year. Financing is completed as an 80% Federal and 20% Local.
6. All other buses assume 80% funding through FTA Section 5311 program, 10% funding from State, and remaining 10% from local governments.

7.3 Facility Improvement Costs and Funding Sources

Several facility improvements have been identified for RADAR. These improvements include upgrades to a Computerized Scheduling and Dispatching System, purchase of security cameras for the bus fleet, and improved security at the transit center.

Currently none of these items have been planned as part of the proposed budget submitted to DRPT for funding; therefore, the projects would be part of the "unconstrained" capital plan and no detailed information is presented as part of the TDP.

It is expected that these improvements could be constructed at the end of the TDP's six-year time frame in FY2014.

8.0 TDP MONITORING AND EVALUATION

Similar to any other multi-year duration planning document, the transit development plan (TDP) for a specific public transit system must be regularly monitored and evaluated in order to maintain its usefulness over time. The previous chapters of this TDP have presented a comprehensive evaluation of the RADAR system's service and cost characteristics. The key elements that have been addressed in this TDP effort include:

- The development of suggested goals, objectives, and general performance standards that can be used to help guide the further development of RADAR's services;
- A detailed evaluation of existing service characteristics, with a discussion of the system's current strengths and weaknesses;
- A peer agency review that compares the recent service and financial characteristics of RADAR to those of other similar demand-responsive and fixed-route public transportation systems operating in the Commonwealth of Virginia;
- An on-board ridership survey that identified the primary socioeconomic characteristics of the current riders, their satisfaction with the existing services, and potential service improvements that are desired by the riders;
- A description of potential service and facility improvements for consideration in the TDP;
- A series of recommended service and facility improvements for inclusion in the TDP, with the year of the improvements identified as appropriate; and
- A discussion of the funding requirements and potential funding sources for the capital and operating costs associated with the recommended service and facility improvements.

This TDP represents an initial step in the future service and facility improvements for the RADAR system. In order to ensure the relevance of the TDP over time, it will be important for RADAR to regularly coordinate with other transportation and land use planning efforts across its multijurisdictional service area, to continue to monitor service performance, and to provide DRPT with annual updates regarding implementation of the ultimately adopted TDP service and facility improvements program.

8.1 Coordination with Other Plans and Programs

The completion of this TDP requires that it be coordinated with a variety of other ongoing land use and transportation planning efforts at the county, regional, and statewide levels. For example, the public transit-oriented goals and objectives suggested by this TDP should be reviewed and incorporated into the transportation-related goals and objectives sections of each of the county comprehensive plans for those counties that are currently being served by RADAR. The multijurisdictional long-range regional transportation plans developed by the Roanoke Valley Alleghany Regional Commission for the Roanoke Metropolitan Area and for the

five-county region which comprises the planning district commission in cooperation with the Virginia Department of Transportation (VDOT) and the Department of Rail and Public Transportation (DRPT) should also include appropriate references to the RADAR TDP.

At the statewide level, the TDP recommendations for RADAR should be incorporated into the public transportation elements of the DRPT developed six-year state transportation improvement program (SYTIP) and the statewide multimodal long-range transportation plan VTrans2035.

8.2 Service Performance Monitoring

In prior chapters of this TDP, a group of specific system-wide performance measures and operating guidelines have been identified for application to a multi-service rural and small urban area fixed-route and an urban/suburban demand-responsive public transit system such as RADAR. The adoption of these operating guidelines will allow for the system's management to regularly monitor the performance of RADAR to help ensure that existing performance characteristics do not degrade over time.

Where changes in performance are identified, appropriate corrective measures should be investigated. These corrective actions might involve route realignment adjustments for local fixed-route services, modifications to service frequency (headway), and/or span of service adjustments. RADAR presently has a basic performance monitoring program in place, with an emphasis on tracking ridership, service-hours, service-miles, and operating costs and revenues on a monthly basis at the route/service area specific and system-wide levels. These reports are presented monthly by the system manager to the members of the RADAR Board of Directors and are made available to representatives of the other communities in which service is provided. As the system continues to grow and develop, this process should be expanded as necessary.

An important element of this performance monitoring process should be a regularly scheduled update of the on-board ridership survey conducted as part of this TDP process. In order to comply with current DRPT guidelines, a new on-board survey should be undertaken at least once during each six-year TDP cycle. With the initial system-wide survey being conducted in the spring of 2009, the next such survey should be conducted no later than during the spring of 2015.

8.3 Annual TDP Monitoring

The current TDP guidelines issued by DRPT require the submittal of an annual update letter that describes the progress being taken towards implementing the TDP's recommendations and any significant changes to the currently adopted TDP. These changes should include, but not be limited to, system expansions or reductions, new services or facilities being planned or

implemented, organizational/governance changes, changes to the current fare structure, or other actions. The recommended contents of this "TDP Update" letter include the following:

- A summary of ridership trends at the system and service area/local route level for each of the previous 12 months.

- A description of those TDP goals and objectives that have been advanced over the previous 12 months.

- A description of any service and facility improvements that have been implemented in the previous 12 months, including the identification of those that were identified in this TDP.

- An update to the TDP's list of recommended service and facility improvements. This list should specifically identify those service or facility improvements that are being shifted to a new year, being eliminated, and/or are being added. This update of recommended improvements should be extended one more fiscal year into the future in order to maintain a six-year TDP planning period.

- A summary description of current fiscal year capital and operating costs and the associated federal, state, and local funding sources.

- Updates to the capital and operating financial plan tables presented in Chapter 7 of this TDP. These tables should be extended one more fiscal year into the future in order to maintain a six-year TDP planning period.

APPENDIX C.
FLEET INVENTORY
From DRPT's On-Line Grant Application (OLGA) System

RADAR Inventory Vehicles Data

Grantee	FTA Code	VIN	Number of Passengers	Model Year	Description	Engine Type	Purchase Date	Purchased New?	Purchase Price	Wheelchair Accessible?	Total Mileage	Primary Route Type	Average Hours operated per week	Average Miles Traveled per week	Location of Item	Comments
RADAR / Covington & Clifton Forge	11.12.15 - Vans	1FD4E45S68DA81042	14	2008	#28 FORD BOC 2008	Gasoline	5/16/2008	Yes	49043	Yes	1267	Rural	40	1000	Covington	UNIT # 28
RADAR / Covington & Clifton Forge	11.12.15 - Vans	1FD4E45S48DA81041	14	2008	#30 FORD BOC 2008	Gasoline	5/16/2008	Yes	49043	Yes	4874	Rural	40	975	Covington	UNIT # 30
RADAR / Roanoke	11.12.15 - Vans	1FD3E35S18DA81035	7	2008	#7 FORD BOC	Gasoline	5/1/2008	Yes	56865	Yes	3724	Rural	40	975	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FD3E35S38DA81036	7	2008	#8 FORD BOC	Gasoline	5/1/2008	Yes	56865	Yes	3135	Rural	40	975	Roanoke	RADAR FY08-5310
RADAR / Roanoke	11.12.15 - Vans	1FD3E35S18DA85084	7	2008	#10 FORD BOC	Gasoline	5/1/2008	Yes	46007	Yes	3216	Rural	40	975	Roanoke	RADAR FY08-5311
RADAR / Roanoke	11.12.15 - Vans	1FD3E35S38DA85085	7	2008	#14 FORD BOC	Gasoline	5/1/2008	Yes	46007	Yes	2826	Rural	40	975	Roanoke	RADAR FY08-5311
RADAR / Roanoke	11.12.15 - Vans	1FD3E35S58DA81037	7	2008	#2 FORD BOC	Gasoline	5/16/2008	Yes	47387	Yes	2089	Rural	40	975	Roanoke	RADAR FY08-5311
RADAR / Roanoke	11.12.15 - Vans	1FD3E35S58DA85086	7	2008	#36 FORD BOC	Gasoline	5/16/2008	Yes	47387	Yes	2107	Rural	40	975	Roanoke	RADAR FY08-5311
RADAR / Roanoke	11.12.15 - Vans	1FDXE45F53HA20315	12	2003	# 58 - FORD (BOC)	No. 2 Grade Diesel Fuel	2/28/2003	Yes	48754	Yes	174392		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35F83HB33357	10	2003	# 3 - FORD (BOC)	No. 2 Grade Diesel Fuel	4/24/2004	Yes	48754	Yes	129018		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDXE45P87DA69885	14	2007	# 54 - FORD (BOC)	No. 2 Grade Diesel Fuel	6/28/2002	Yes	49408	Yes	27705		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35P85HB39512	10	2005	# 4 - FORD (BOC)	No. 2 Grade Diesel Fuel	7/1/2005	Yes	50203	Yes	73509	Rural	0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35P85HB37565	10	2005	# 61 - FORD (BOC)	No. 2 Grade Diesel Fuel	8/16/2005	Yes	47290	Yes	59965		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35P65HB37564	10	2005	# 60 - FORD (BOC)	No. 2 Grade Diesel Fuel	8/16/2005	Yes	47290	Yes	70920		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1GNDX03E22D265896	2	2002	# 55 - CHEV.	Gasoline	12/4/2001	Yes	47570	Yes	156194		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35PX5HB39513	10	2005	# 11 - FORD (BOC)	No. 2 Grade Diesel Fuel	7/1/2005	Yes	50203	Yes	64474		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDXE45P85HB37575	19	2005	# 47 - FORD (BOC)	No. 2 Grade Diesel Fuel	7/1/2005	Yes	53797	Yes	49290		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35P15HB39514	10	2005	# 59 - FORD (BOC)	No. 2 Grade Diesel Fuel	7/20/2005	Yes	50203	Yes	41743		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDXE45P36DA54192	10	2006	# 25 - FORD (BOC)	No. 2 Grade Diesel Fuel	9/13/2006	Yes	49698	Yes	50888		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDXE45P56DA54193	12	2006	# 34 - FORD (BOC)	No. 2 Grade Diesel Fuel	9/13/2006	Yes	49698	Yes	50048		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDXE45P96DA54195	10	2006	# 48 - FORD (BOC)	No. 2 Grade Diesel Fuel	9/13/2006	Yes	49698	Yes	62423		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35FX3HB77439	10	2003	# 46 - FORD (BOC)	No. 2 Grade Diesel Fuel	4/24/2004	Yes	48754	Yes	104237		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35F03HB83847	10	2004	# 5 - FORD (BOC)	No. 2 Grade Diesel Fuel	1/1/2004	Yes	50203	Yes	158405		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35F23HB83848	10	2004	# 24 - FORD (BOC)	No. 2 Grade Diesel Fuel	1/1/2004	Yes	50236	Yes	122885		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35P44HB09924	8	2004	# 9 - FORD (BOC)	No. 2 Grade Diesel Fuel	1/25/2005	Yes	44308	Yes	83908		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1GBJG31U631223245	10	2003	# 45 - CHEV (BOC)	Gasoline	3/2/2005	No	6000	Yes	106763	Rural	0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDXE45F13HA20313	12	2003	# 56 - FORD (BOC)	No. 2 Grade Diesel Fuel	12/2/2002	Yes	51030	Yes	146053		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDXE45FX3HA20312	12	2003	# 57 - FORD (BOC)	No. 2 Grade Diesel Fuel	12/2/2002	Yes	51030	Yes	142445		0	0	Roanoke	RADAR
RADAR / Roanoke	11.12.15 - Vans	1FDWE35F32HA01394	10	2002	# 21 - FORD (BOC)	No. 2 Grade Diesel Fuel	9/17/2002	Yes	46860	Yes	164638		0	0	Roanoke	RADAR

APPENDIX D.
OPERATING AND CAPITAL EXPENSES AND REVENUES
A 3-Year Retrospective

HISTORICAL OPERATING STATISTICS
RADAR

Operating Statistics	2006	2007	2008
Annual Passengers	17,112	18,190	21,817
Annual Operating Costs	$ 249,805	$ 311,790	$ 302,582
Annual Revenue Miles	87,271	93,750	113,928
Annual Revenue Hours	5,770	6,987	6,488
Passengers per Revenue Mile	0.20	0.19	0.19
Passengers per Revenue Hour	2.97	2.60	3.36
Cost per Passenger	$14.60	$17.14	$13.87
Cost per Revenue Mile	$2.86	$3.33	$2.66
Cost per Revenue Hour	$43.29	$44.62	$46.64

System Revenues and Operating Assistance	2006	2007	2008
Passenger Fares	$ 15,395	$ 15,822	$ 14,935
Contract Revenues	$ -	$ -	$ -
Local Operating Assistance	$ 83,011	$ 112,649	$ 96,685
State Operating Assistance	$ 31,861	$ 35,337	$ 47,138
Federal Operating Assistance	$ 114,872	$ 147,984	$ 143,824
Totals	$ 245,139	$ 311,792	$ 302,582
Net Operating Cost	$ 229,744	$ 295,970	$ 287,647

Allocation of Net Operating Cost Funding Source	2006	2007	2008
Local Governments	36.1%	38.1%	33.6%
State Government	13.9%	11.9%	16.4%
Federal Government	50.0%	50.0%	50.0%
Totals	100.0%	100.0%	100.0%
Pass Fares % of Opns Cost	6.3%	5.1%	4.9%

APPENDIX E.
TRANSIT RIDER ON-BOARD SURVEY RESULTS

E.1 On-Board Survey Process – Demand Response

Between February 24 and 26, 2009, RADAR Transit conducted a customer satisfaction survey for their demand-response service. One hundred fifty surveys were distributed and 96 completed surveys were returned (a 64% rate of return). The survey results generated the following major findings:

- 99% of the survey respondents were happy with the system drivers.
- 97% of the respondents were happy with the frequency of bus service.
- 97% of the respondents indicated that the transit services were being provided on time.
- 99% of the respondents were happy with the cost and security of the bus service.
- 84% of the demand response survey respondents indicated that they were regular riders of RADAR Transit.

Based on the results summary, it appears that in early 2009, most of the demand response system survey responses were positive and that the riders were generally satisfied with the services that RADAR Transit provided at that time.

A copy of the survey questionnaire is presented as **Figure E-1**. The summary results of the ridership survey are presented in the tables below. The compiled survey data from the returned surveys is contained in the Data Input Sheets at the end of this Appendix. This data includes the written comments provided on the various survey forms. The contents of this appendix also include the detailed ridership survey tables compiled for each of the individual service areas in which RADAR Transit demand-response service currently operates. This allows for comparison between the STAR and CORTRAN services.

The following tables summarize the system-wide results of the demand-response service on-board ridership survey of RADAR Transit.

Date_____ Route_____ Approx. Boarding Time _____ Survey No_____

Dear Rider: RADAR is presently evaluating existing and future transit service needs. Please take a minute and fill out this survey regarding your opinions of RADAR's transit service. When finished please return the survey to the bus driver or mail to: **RADAR, P.O. Box 13825, Roanoke, Virginia 24017. *Thank you for your help.***

About You

1. I am: ☐ Male ☐ Female

2. My age is:
☐ 19 or under ☐ 30-39 ☐ 50-59
☐ 20-29 ☐ 40-49 ☐ 60 or older

3. My race is primarily:
☐ Caucasian ☐ Hispanic
☐ African-American ☐ Other

4. I have completed:
☐ Did not graduate from High School
☐ High School graduate/GED
☐ Some College
☐ College degree or higher

5, My home's total annual income is:
☐ Under $10,000 ☐ $30,000-$40,000
☐ $10,000-$20,000 ☐ $40,000-$50,000
☐ $20,000-$30,000 ☐ Over $50,000

7. How often do you regularly ride the RADAR Transit Service?
☐ Less than once a month
☐ Once or twice a month
☐ 1 day a week
☐ 2-3 days a week
☐ 4 or more days a week

8. How often do you ride RADAR Transit's regular fixed route service?
☐ Never have used the service
☐ Less than once a month
☐ Once or twice a month
☐ More than twice a month
☐ Once a week or more

About Your Trip Today

9. Where did your current trip begin?
☐ Your Home ☐ Medical/Dental
☐ Work ☐ Social/Recreational
☐ School/College ☐ Service Agency
☐ Shopping
☐ Other _____

10. Where was that located? (Town/County)
Address, Major Intersection or Nearby Landmark
(shopping center name, hospital, school name, etc)

_____

11. Where are you going now?
☐ Your Home ☐ Medical/Dental
☐ Work ☐ Social/Recreational
☐ School/College ☐ Service Agency
☐ Shopping
☐ Other _____

12. Where is that located? (Town/County)
Address, Major Intersection or Nearby Landmark
(shopping center name, hospital, school name, etc)

_____

13. Why did you ride the bus today?
☐ I don't have a car ☐ Car not available
☐ Prefer to ride bus ☐ To save time
☐ To save money
☐ Have a Disability / Unable to Drive
☐ Other _____

Rate the RADAR Transit System's Service

14. Please rate the following characteristics of the RADAR system transit service:	Very Good	Good	Okay	Poor	Very Poor	Not Sure
a. Required reservation procedures	☐	☐	☐	☐	☐	☐
b. Bus on-time performance	☐	☐	☐	☐	☐	☐
c. Hours of Demand-Response service	☐	☐	☐	☐	☐	☐
d. Cost of the bus fare	☐	☐	☐	☐	☐	☐
e. Sense of security on buses	☐	☐	☐	☐	☐	☐
f. Cleanliness of buses	☐	☐	☐	☐	☐	☐
g. Courtesy/friendliness of bus drivers	☐	☐	☐	☐	☐	☐
h. OVERALL SERVICE	☐	☐	☐	☐	☐	☐

Identify Future Service Improvement Needs

16. What service improvements would you like to see over the next several years?	Very Important	Somewhat Important	Not Important	Not Sure
a. Less advance time required to schedule trip	☐	☐	☐	☐
b. Expand hours / days of service	☐	☐	☐	☐
c. Improve security on buses	☐	☐	☐	☐
d. Other: _____	☐	☐	☐	☐

Thank You for Your Time!

Figure E-1. On-Board Survey Questionnaire for RADAR Transit

E.2 Responses to Survey Questions

E.2.1 DEMOGRAPHIC SURVEY INFORMATION – Demand Response

Summary. **Table E-1** summarizes the passenger characteristics of the current RADAR Transit ridership based upon the information contained in the returned surveys.

Table E-1

Summary of RADAR Transit Passenger Characteristics

Gender	Number	Percent
Male	47	49.0%
Female	49	51.0%
No Response	*0*	
Total Responding	96	100.0%

Age	Number	Percent
19 or under	2	2.5%
20-29	10	12.7%
30-39	3	3.8%
40-49	5	6.3%
50-59	17	21.5%
60 or older	42	53.2%
No Response	*17*	
Total Responding	79	100.0%

Race	Number	Percent
Caucasian	67	74.4%
African-American	19	21.1%
Hispanic	0	0.0%
Other	4	4.4%
No Response	*6*	
Total Responding	90	100.0%

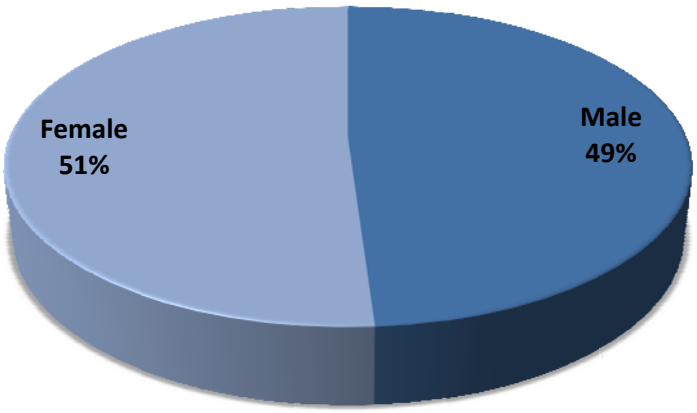
Educational Level	Number	Percent
Not High School Graduate	16	20.3%
High School Graduate / GED	25	31.6%
Some College	18	22.8%
College Degree or Higher	20	25.3%
No Response	*17*	
Total Responding	79	100.0%

Household Annual Income	Number	Percent
Under $10,000	18	29.5%
$10,000 - $20,000	15	24.6%
$20,000 - $30,000	10	16.4%
$30,000 - $40,000	10	16.4%
$40,000 - $50,000	2	3.3%
Over $50,000	6	9.8%
No Response	*35*	
Total Responding	61	100.0%

Frequency of Ridership	Number	Percent
Less than once a month	2	2.3%
Once or twice a month	9	10.2%
1 day a week	3	3.4%
2-3 days a week	36	40.9%
4 or more days a week	38	43.2%
No Response	*8*	
Total Responding	88	100.0%

Gender

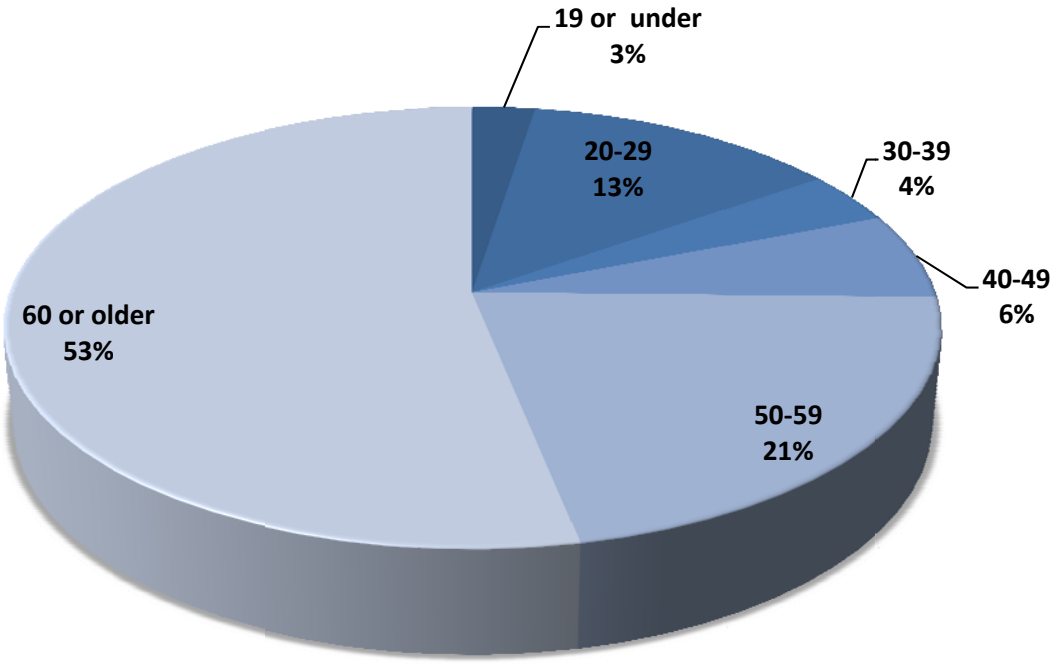
Figure E-2. Survey Results: Gender



As **Figure E-2** shows, male and female passengers are relatively even in number, with 49% male and 51% female riders during the period of the on-board survey.

Age

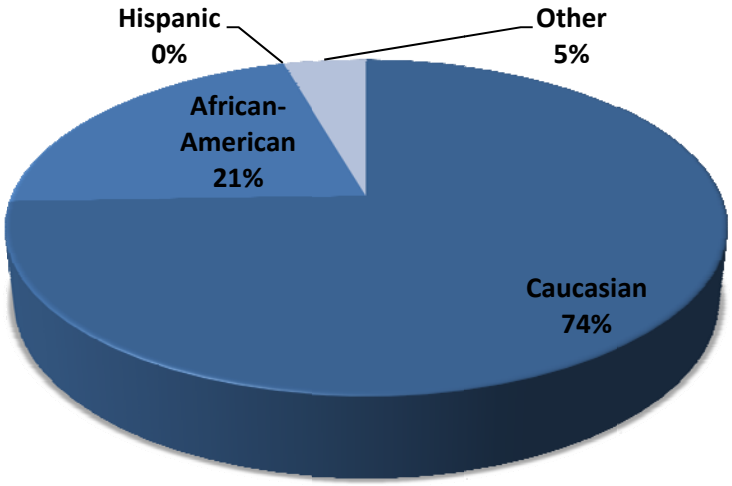
Figure E-3. Survey Results: Age



The passengers' ages are relatively well-distributed across each of the different ranges that were defined. However, based on the ridership survey results, those people who are age 50 or older are the major users of RADAR Transit, making up nearly 74% of the demand response service. In addition, the highest single percentage for any of the age categories was over 60, making up approximately 53% of the respondents. The proportion of the RADAR Transit demand-response service ridership which is younger than 50 years of age is about 25%.

Race

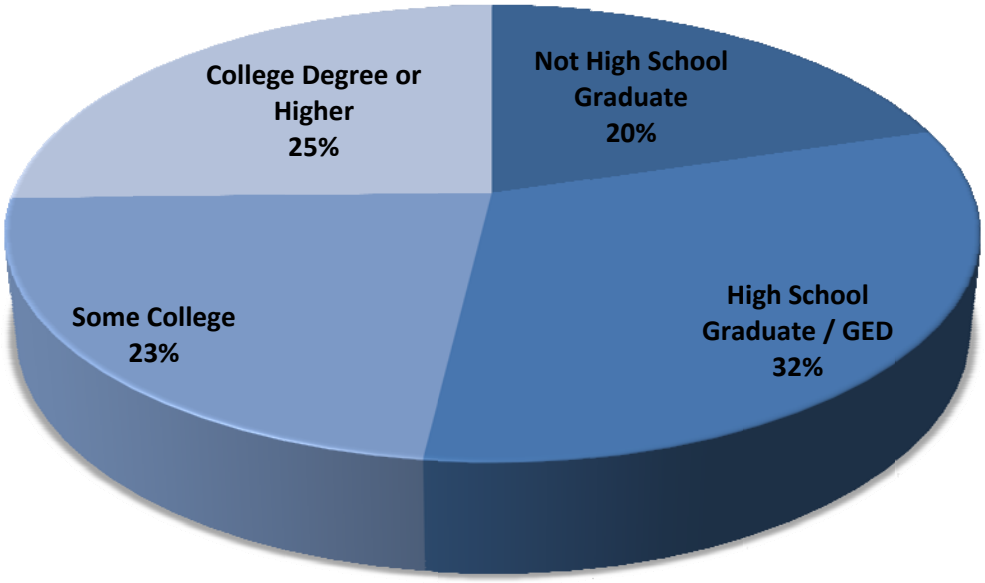
Figure E-4. Survey Results: Race



African-American and Caucasian are the top two races using the RADAR demand-response service. The combined percentage of these two races is almost 95% with 74% being Caucasian and 21% being African-American. Hispanic and Other races represented 4% of the reported ridership.

Education Level

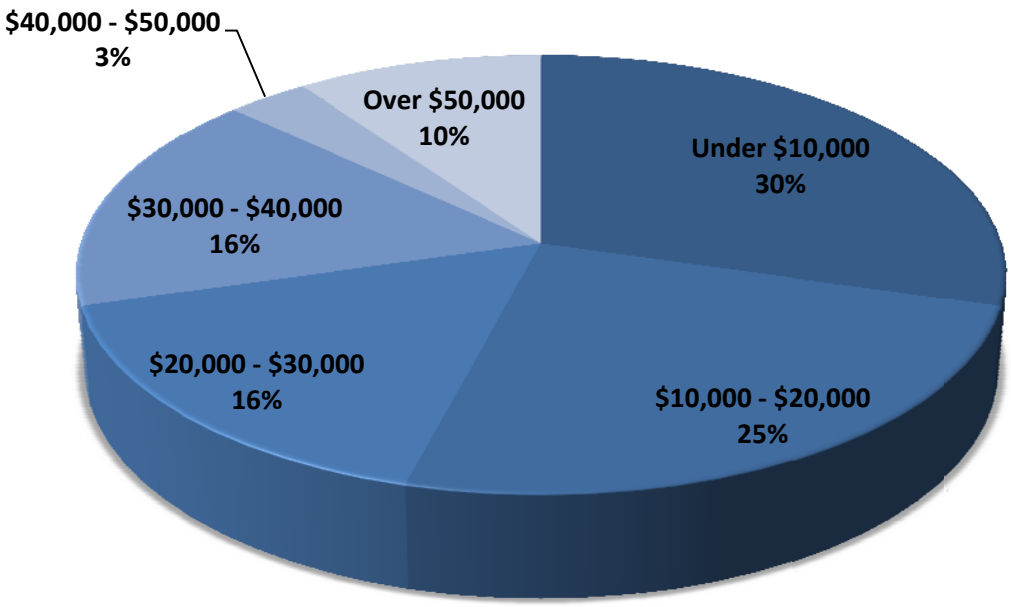
Figure E-5. Survey Results: Education Level



With respect to the reported educational level, approximately 52% of the passengers indicated that they either possessed a high school degree (31.6%) or had not graduated from high school (20.3%). About 23% of the riders reported having attended some college while about 25% reported having earned at least a collegiate level bachelor's degree. Those who did not respond to this question represented about 18% of the total ridership.

Annual Household Income

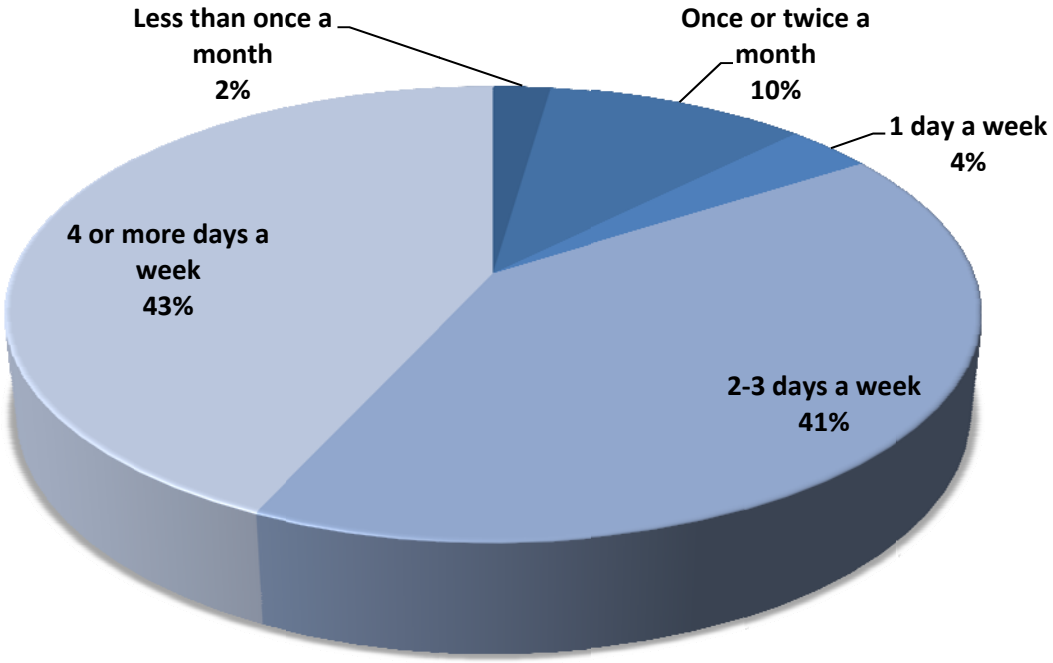
Figure E-6. Survey Results: Annual Household Income



Members of the lower income population are the major users of RADAR Transit. A total of about 55% of the total RADAR demand-response service passengers reported less than $20,000 for their household annual income with almost 30% of the passengers reporting a household income level of less than $10,000 per year. About 16% of riders reported an annual income of between $20,000 and $30,000 while an additional 16% reported annual incomes between $30,000 and $40,000 per year. Those reporting annual household income levels of between $40,000 and $50,000 were about 3% of the total ridership while those with reported annual household incomes of over $50,000 per year were about 10%. **Even with the high degree of non respondents, it would appear that the system is transporting persons representing all of the income levels found in the RADAR service area.**

Frequency of Ridership

Figure E-7. Survey Results: Frequency of Ridership



Most of the people who participated in this survey reported using RADAR's demand-response services on a regular basis. A total of almost 43% of the riders reported a ridership frequency of 4 or more days a week, with an additional 41% reporting use of the system 2-3 days a week. Combining these two values indicates that about 84% of the total passengers surveyed use the RADAR demand-response services more than two days per week and can thus be classified as "regular" rather than occasional riders. **This high level of repeat ridership further indicates that the RADAR demand-response operations are providing an essential mobility service to a broad cross-section of its passengers.**

E.2.2 TRIP-SPECIFIC SURVEY RESULTS – Demand Response

Summary. **Table E-2** summarizes the responses of the demand-response service passengers to the on-board survey questions related to the trip being made at the time of the administration of the survey.

Table E-2 About Your Trip Today (Demand Response Service)

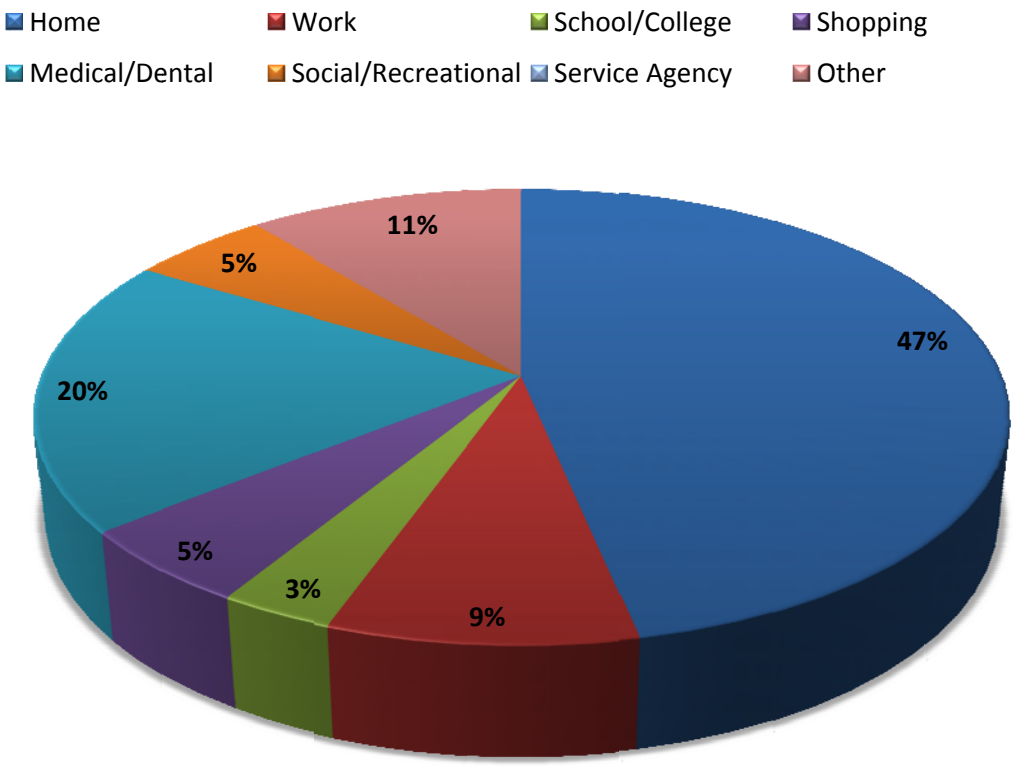
Trip Origin Type	Number	Percent
Home	43	46.7%
Work	8	8.7%
School/College	3	3.3%
Shopping	5	5.4%
Medical/Dental	18	19.6%
Social/Recreational	5	5.4%
Service Agency	0	0.0%
Other	10	10.9%
No Response	*4*	
Total Responding	92	100.0%

Trip Destination Type	Number	Percent
Home	42	45.7%
Work	7	7.6%
School/College	2	2.2%
Shopping	1	1.1%
Medical/Dental	20	21.7%
Social/Recreational	4	4.3%
Service Agency	0	0.0%
Other	16	17.4%
No Response	*4*	
Total Responding	92	100.0%

Reason for Riding	Number	Percent
Don't have a car	31	34.4%
Car not available	11	12.2%
Prefer to ride bus	2	2.2%
To save time	0	0.0%
To save money	1	1.1%
Disability/unable to drive	41	45.6%
Other	4	4.4%
No Response	*0*	
Total Responding	90	100.0%

Trip Origin

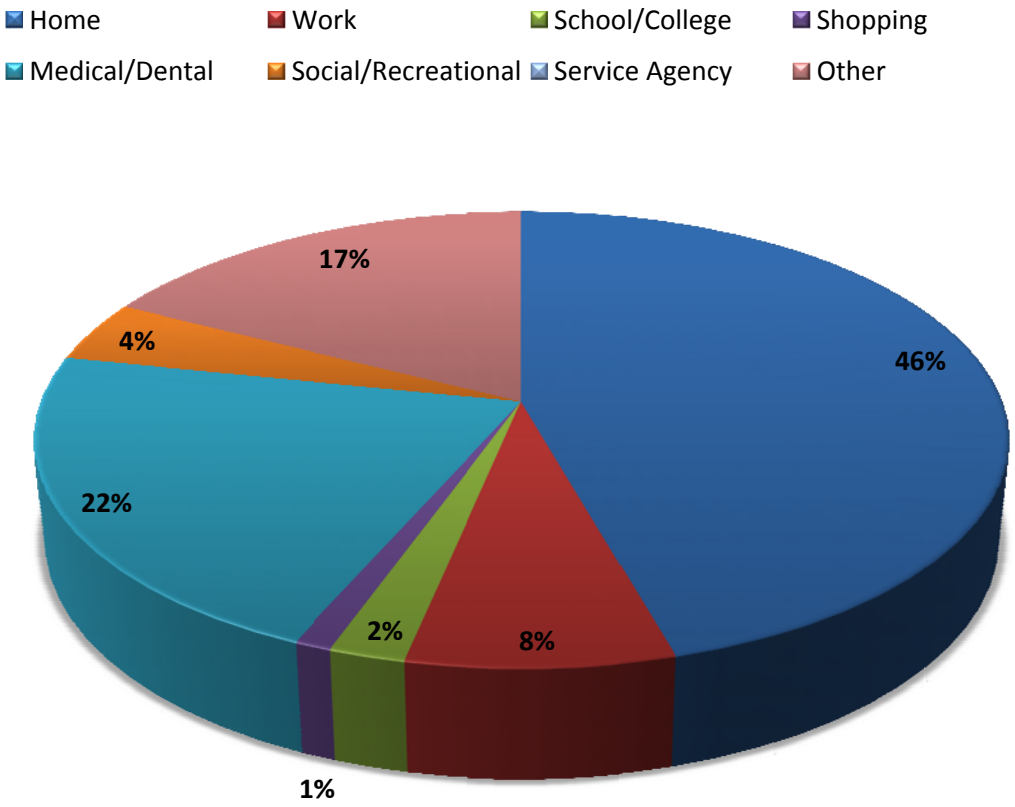
Figure E-8. Survey Results: Trip Origin



As shown in **Figure E-8**, the greatest number (almost 47%) of the passengers started their trips from their home. About 20% of the passengers reported starting their trips from a medical or dental location. The three next most frequent trip origins were cited as being "Other" (10.9%), "Work" (8.7%), Shopping" (5.4%), and "Social/Recreational" (5.4%).

Trip Destination

Figure E-9. Survey Results: Trip Destination



The top four trip destinations were noted as being ”Home” at 45.7%, “Medical/Dental” at 21.7%, ”Other” at 17.4%, and ”Work” at 7.6%. These four destinations account for about 92% of the total demand-response service passenger trips. **These results demonstrate that the current ridership is using the RADAR Transit system for basic mobility purposes between their homes and their workplace or other important destinations.**

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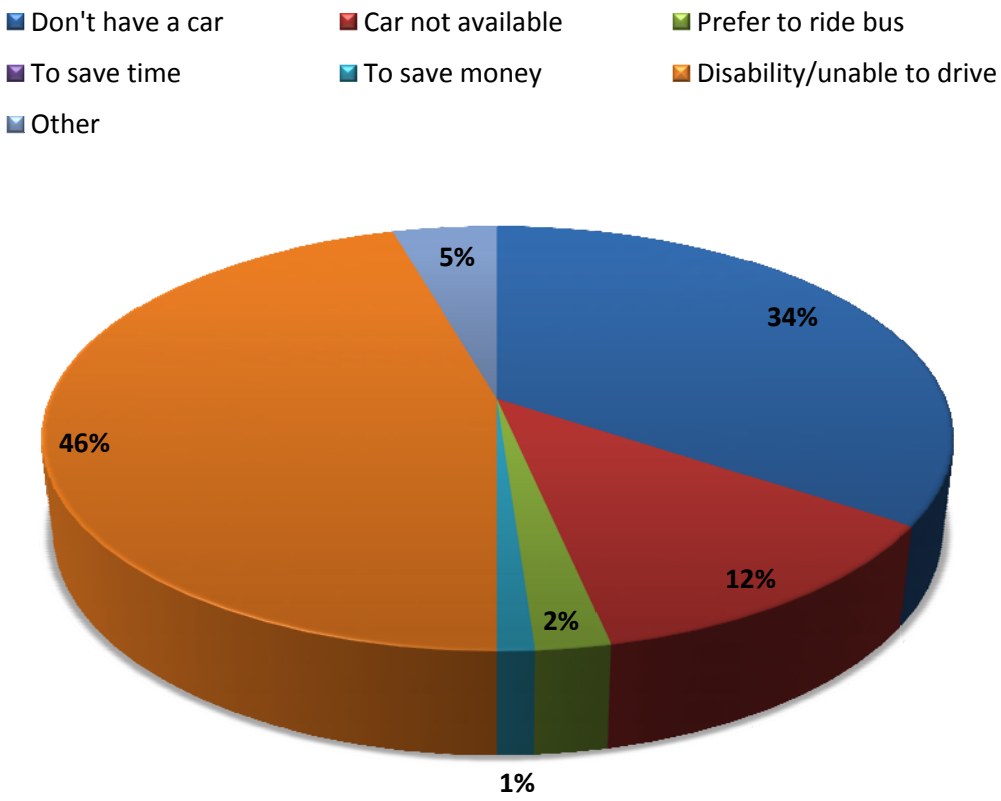
Reason for Riding Transit

Figure E-10. Survey Results: Reason for Riding Transit



When asked to identify the principal reason why they were riding the bus, survey respondents most frequently indicated that they generally have "Disability/unable to drive" (45.6%), "Did Not Have a Car" (34.4%), or that a "Car Was Not Available" (12.2%). Combined, these three responses accounted for almost 92% of the reasons for using the RADAR demand-response transit service.

These responses would appear to indicate that the current ridership can be classified as "transit captives"; that is, they have few if any other travel options available and if the current transit service was not provided, the subject trip would probably not be made. With a large percentage of the trips being for work, shopping, or medical/dental purposes this lack of basic mobility could result in significant negative effects on the ability of the study area population to obtain meaningful employment or necessary medical services.

E.2.3 SERVICE RATINGS SURVEY RESULTS – Demand Response

Figure E-11 and **Table E-3** summarize the responses to those survey questions which sought to obtain the view of the current demand-response service riders as to the quality of service currently being offered by RADAR. The service factors presented for rating were as follows:

- Reservation procedures
- Bus on-time performance
- Hours of bus service
- Cost of bus fare
- Sense of security on the buses

Figure E-11. Survey Results: Service Ratings

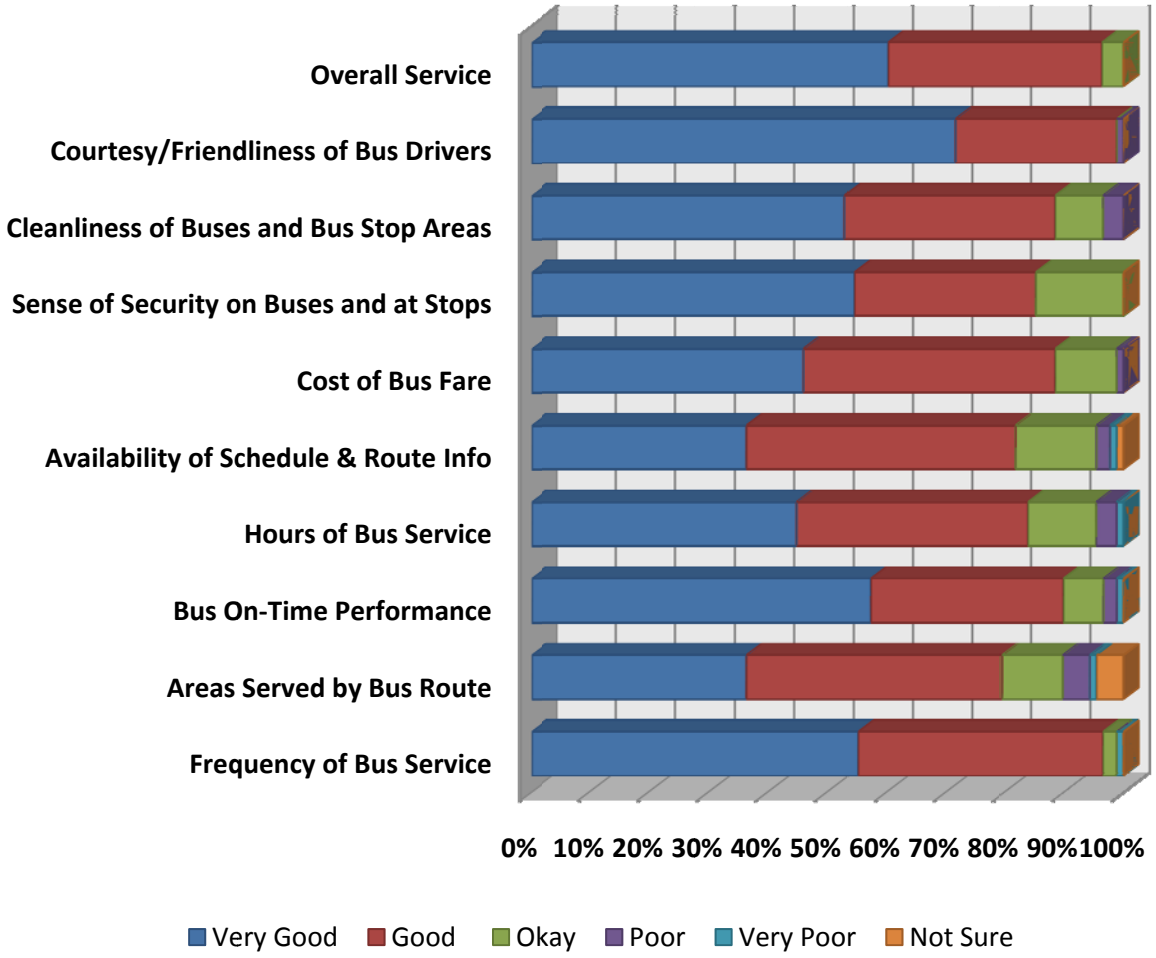


Table E-3. Survey Results: Service Ratings

Frequency of bus service	Number	Percent
Very Good	48	55.2%
Good	36	41.4%
Okay	2	2.3%
Poor	0	0.0%
Very Poor	1	1.1%
Not Sure	0	0.0%
No Response	*9*	
Total Responding	87	100.0%

Cost of bus fare	Number	Percent
Very Good	40	46.0%
Good	37	42.5%
Okay	9	10.3%
Poor	1	1.1%
Very Poor	0	0.0%
Not Sure	0	0.0%
No Response	*9*	
Total Responding	87	100.0%

Areas that are served by bus routes	Number	Percent
Very Good	32	36.4%
Good	38	43.2%
Okay	9	10.2%
Poor	4	4.5%
Very Poor	1	1.1%
Not Sure	4	4.5%
No Response	*8*	
Total Responding	88	100.0%

Sense of security on buses & at stops	Number	Percent
Very Good	48	54.5%
Good	27	30.7%
Okay	13	14.8%
Poor	0	0.0%
Very Poor	0	0.0%
Not Sure	0	0.0%
No Response	*8*	
Total Responding	88	100.0%

Bus on-time performance	Number	Percent
Very Good	51	57.3%
Good	29	32.6%
Okay	6	6.7%
Poor	2	2.2%
Very Poor	1	1.1%
Not Sure	0	0.0%
No Response	*7*	
Total Responding	89	100.0%

Cleanliness of buses & bus stop areas	Number	Percent
Very Good	46	52.9%
Good	31	35.6%
Okay	7	8.0%
Poor	3	3.4%
Very Poor	0	0.0%
Not Sure	0	0.0%
No Response	*9*	
Total Responding	87	100.0%

Hours of bus service	Number	Percent
Very Good	39	44.8%
Good	34	39.1%
Okay	10	11.5%
Poor	3	3.4%
Very Poor	1	1.1%
Not Sure	0	0.0%
No Response	*9*	
Total Responding	87	100.0%

Courtesy/friendliness of bus drivers	Number	Percent
Very Good	63	71.6%
Good	24	27.3%
Okay	0	0.0%
Poor	1	1.1%
Very Poor	0	0.0%
Not Sure	0	0.0%
No Response	*8*	
Total Responding	88	100.0%

Availability of schedules & route information	Number	Percent
Very Good	32	36.4%
Good	40	45.5%
Okay	12	13.6%
Poor	2	2.3%
Very Poor	1	1.1%
Not Sure	1	1.1%
No Response	*8*	
Total Responding	88	100.0%

OVERALL SERVICE	Number	Percent
Very Good	50	60.2%
Good	30	36.1%
Okay	3	3.6%
Poor	0	0.0%
Very Poor	0	0.0%
Not Sure	0	0.0%
No Response	*13*	
Total Responding	83	100.0%

For each of these ten evaluation measurements, the responses from the riders provided combined ratings of "Very Good" or "Good" in the range of 80-99% for every measurement. The highest positive service factor ratings were for "Courtesy/Friendliness of Bus Drivers" with 71.6% "Very Good", 27.3% "Good", and 0.0% "Okay" for a total of 98.9% total positive rating and for "Bus On Time Performance" with 57.3% "Very Good", 32.6% "Good", and 6.7% "Okay" for a total of 96.6% total positive rating.

The "Overall Service" rating for the RADAR demand-response service was 60.2% "Very Good", 36.1% "Good", and 3.6% "Okay" for a combined total of 99.9% positive. None of the riders rated the current demand-response service as "Poor" or "Very Poor".

These findings represent a very positive reaction from the passengers. They also indicate that the users are satisfied with the overall services that the RADAR demand-response service provides.

E.2.4 FUTURE SERVICE IMPROVEMENTS SURVEY RESULTS – Demand Response

Figure E-12 and Table E-4 summarize the responses to those survey questions which sought to obtain the view of the current riders as to the importance of a number of potential service improvements that RADAR might wish to consider for application to the demand-response elements of the overall system. The two suggested areas of potential service improvement were:

- Expanded service
- More frequent service

Figure E-12. Survey Results: Future Service Improvements

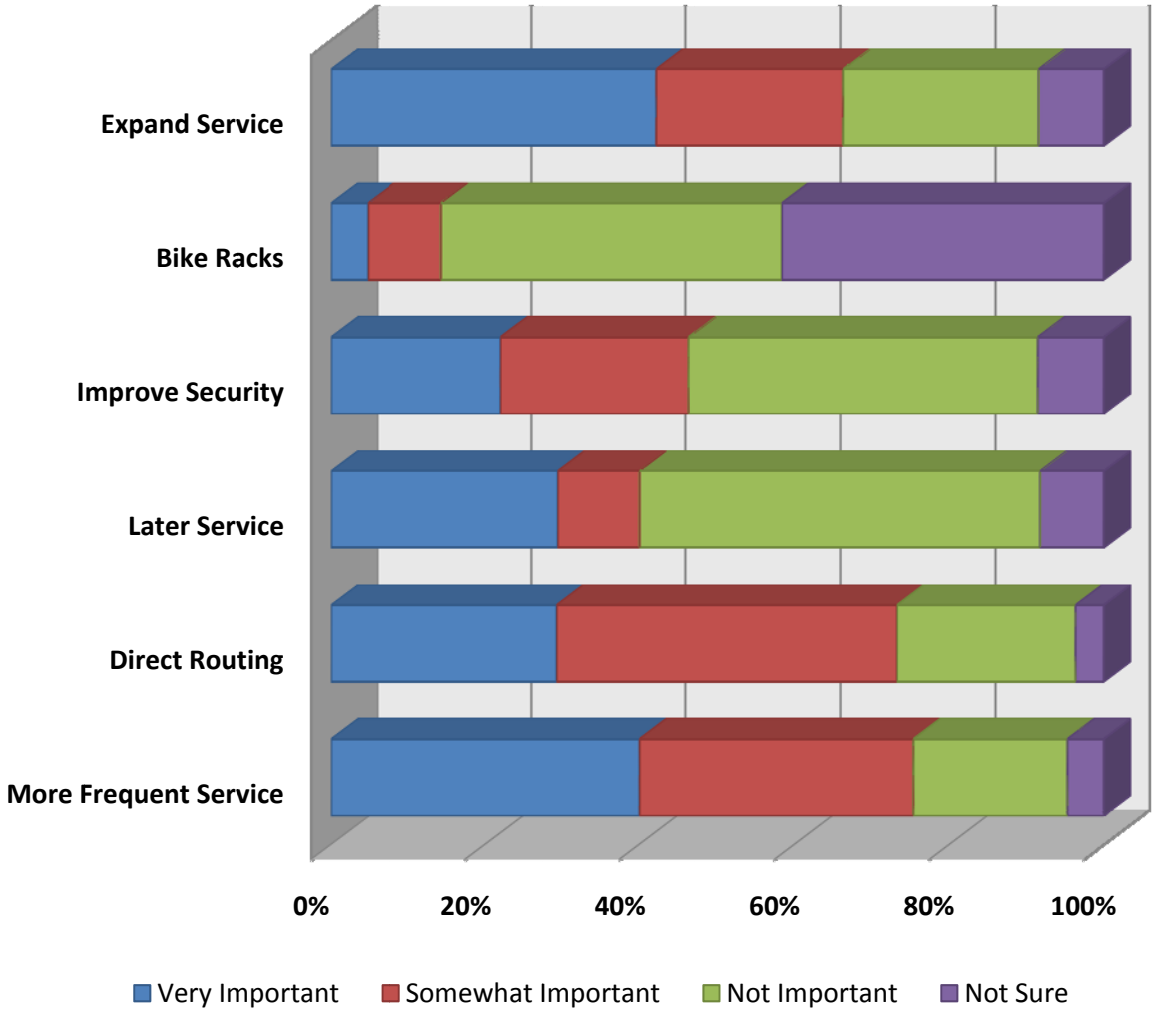


Table E-4 Improvements Needed on Demand Response Service

More Frequent	Number	Percent
Very Important	34	40.0%
Somewhat Important	30	35.3%
Not Important	17	20.0%
Not Sure	4	4.7%
No Response	*11*	
Total Responding	85	100.0%

Improve Security	Number	Percent
Very Important	18	22.0%
Somewhat Important	20	24.4%
Not Important	37	45.1%
Not Sure	7	8.5%
No Response	*14*	
Total Responding	82	100.0%

Direct Routing	Number	Percent
Very Important	24	29.3%
Somewhat Important	36	43.9%
Not Important	19	23.2%
Not Sure	3	3.7%
No Response	*14*	
Total Responding	82	100.0%

Bike Racks	Number	Percent
Very Important	4	4.8%
Somewhat Important	8	9.5%
Not Important	37	44.0%
Not Sure	35	41.7%
No Response	*12*	
Total Responding	84	100.0%

Later Service	Number	Percent
Very Important	25	29.4%
Somewhat Important	9	10.6%
Not Important	44	51.8%
Not Sure	7	8.2%
No Response	*11*	
Total Responding	85	100.0%

Expand Service	Number	Percent
Very Important	35	42.2%
Somewhat Important	20	24.1%
Not Important	21	25.3%
Not Sure	7	8.4%
No Response	*13*	
Total Responding	83	100.0%

With respect to “Expand Hours/days of Service”, 42.2% of respondents viewed this as being “Very Important” while an additional 24.1% viewed this as being “Somewhat Important” for a combined importance rating of 66.3%. Conversely, only 25.3% of the respondents rated this as being “Not Important.”

With respect to “More Frequent Service”, 40% of respondents viewed this as being “Very Important” while an additional 35.3% viewed this as being “Somewhat Important” for a combined importance rating of 75.3%. Conversely, only 20% of the respondents rated this as being “Not Important.”

The responses to the potential need for “Bike Racks on the buses” indicate that this is not viewed as being a high priority need from the passengers’ viewpoint.

E.3 On-Board Survey Process – Fixed Route

Between February 24 and March 13, 2009, RADAR Transit conducted a customer satisfaction survey for their Fixed Route – Fixed Schedule service. The survey results generated the following major findings:

- 98% of the survey respondents were happy with the system drivers.
- 99% of the respondents liked the cleanliness of the buses
- 98% of the respondents were happy with the overall quality of the bus service.
- 94% of the respondents were happy with the cost and security of the bus service
- 86% of the respondents said that they could not drive or did not have access to a car.
- 96% of respondents were happy with the on time service of the buses.

Based on the results summary, it appears that in early 2009, most of the Fixed Route – Fixed Schedule service survey responses were positive and that the riders were generally satisfied with the services that RADAR provided at that time.

A copy of the survey questionnaire is presented as **Figure E-13**. The summary results of the ridership survey are presented in the tables below. The compiled survey data from the returned surveys is contained in the Data Input Sheets at the end of this Appendix. This data includes the written comments provided on the various survey forms. The contents of this appendix also include the detailed ridership survey tables compiled for each of the individual service areas in which the RADAR Fixed Route – Fixed Schedule service currently operates. This allows for comparison between the different fixed service – fixed schedule routes.

*Date*_____ *Route* _____ *Approx. Boarding Time* _____ *Survey No.:*_____

Dear Rider: RADAR is presently evaluating existing and future transit service needs. Please take a minute and fill out this survey regarding your opinions of RADAR's transit service. When finished please return the survey to the bus driver or mail to: **RADAR, P.O. Box 13825, Roanoke, Virginia 24017** ***Thank you for your help.***

About You

1. I am: ☐ Male ☐ Female

2. My age is:
☐ 19 or under ☐ 30-39 ☐ 50-59
☐ 20-29 ☐ 40-49 ☐ 60 or older

3. My race is primarily:
☐ Caucasian ☐ Hispanic
☐ African-American ☐ Other

4. I have completed:
☐ Did not graduate from High School
☐ High School graduate/GED
☐ Some College
☐ College degree or higher

5. My home's total annual income is:
☐ Under $10,000 ☐ $30,000-$40,000
☐ $10,000-$20,000 ☐ $40,000-$50,000
☐ $20,000-$30,000 ☐ Over $50,000

6. How often do you ride the RADAR Transit Service?
☐ Less than once a month
☐ Once or twice a month
☐ 1 day a week
☐ 2-3 days a week
☐ 4 or more days a week

7. How often do you ride the RADAR Demand-Responsive / Door-to-Door service?
☐ Never have used the service
☐ Less than once a month
☐ Once or twice a month
☐ More than twice a month
☐ Once a week or more

About Your Trip Today

8. Where did your current trip begin?
☐ Your Home ☐ Medical/Dental
☐ Work ☐ Social/Recreational
☐ School/College ☐ Service Agency
☐ Shopping
☐ Other _____

9. Where was that located? (Town/County)
Address, Major Intersection or Nearby Landmark
(shopping center name, hospital, school name, etc)

_____

10. How did you get to the bus stop?
☐ Walk ☐ Bicycle
☐ Drove car ☐ Other _____

11. Where are you going now?
☐ Your Home ☐ Medical/Dental
☐ Work ☐ Social/Recreational
☐ School/College ☐ Service Agency
☐ Shopping
☐ Other _____

12. Where is that located? (Town/County)
Address, Major Intersection or Nearby Landmark
(shopping center name, hospital, school name, etc)

_____

13. Why did you ride the bus today?
☐ I don't have a car ☐ Car not available
☐ Prefer to ride bus ☐ To save time
☐ To save money
☐ Have a Disability/Unable to Drive
☐ Other _____

Rate the RADAR Transit System's Service

14. Please rate the following characteristics of the RADAR system transit service:	Very Good	Good	Okay	Poor	Very Poor	Not Sure
a. Frequency of bus service	☐	☐	☐	☐	☐	☐
b. Areas that are served by bus routes	☐	☐	☐	☐	☐	☐
c. Bus on-time performance	☐	☐	☐	☐	☐	☐
d. Hours of bus service	☐	☐	☐	☐	☐	☐
e. Availability of schedules & route information	☐	☐	☐	☐	☐	☐
f. Cost of the bus fare	☐	☐	☐	☐	☐	☐
g. Sense of security on buses & at stops	☐	☐	☐	☐	☐	☐
h. Cleanliness of buses & bus stop areas	☐	☐	☐	☐	☐	☐
i. Courtesy/friendliness of bus drivers	☐	☐	☐	☐	☐	☐
j. OVERALL SERVICE	☐	☐	☐	☐	☐	☐

Identify Future Service Improvement Needs

14. What service improvements would you like to see over the next several years?	Very Important	Somewhat Important	Not Important	Not Sure
a. More frequent bus service	☐	☐	☐	☐
b. More direct bus routing to destinations	☐	☐	☐	☐
c. Late evening fixed route service	☐	☐	☐	☐
d. Expand service beyond current routes	☐	☐	☐	☐
e. Improve security on buses & at bus stops	☐	☐	☐	☐
f. Better bike racks on buses	☐	☐	☐	☐
g. Other: _____	☐	☐	☐	☐

Thank You for Your Time!

Figure E-13. On-Board Survey Questionnaire for RADAR Transit

E.4 Survey Response Rates – Fixed Route

The total number of on-board surveys distributed to passengers on the RADAR fixed-route services was 405. The total number of returned surveys was 228. The overall system level return rate was thus approximately 56%. **Table E-5** presents the number of surveys distributed and returned in each of the individual fixed-route service areas. The following tables summarize the system-wide results of the on-board ridership survey of the RADAR Fixed Route – Fixed Schedule service.

Table E-5
Distribution of Passenger Surveys and Return Rate by Service

Route / Service Area	No. Surveys Distributed	No. Surveys Returned	Pct. Return
Hollins Express	100	40	40.0%
Ferrum Express	50	4	8.0%
Maroon Route (Roanoke College)	75	9	12.0%
Mountain Express	150	145	96.7%
PART (Martinsville)	30	30	100.0%
Total	**405**	**228**	**56.3%**

E.5 Responses to Survey Questions

E.5.1 DEMOGRAPHIC SURVEY INFORMATION – Fixed Route

Summary. **Table E-6** summarizes the passenger characteristics of the current RADAR fixed-route service ridership based upon the information contained in the returned surveys.

Table E-6
Summary of RADAR Passenger Characteristics – Fixed-Route Services

Gender	Number	Percent
Male	67	30.9%
Female	150	69.1%
No Response	*11*	
Total Responding	217	100.0%

Age	Number	Percent
19 or under	46	20.5%
20-29	46	20.5%
30-39	21	9.4%
40-49	25	11.2%
50-59	32	14.3%
60 or older	54	24.1%
No Response	*4*	
Total Responding	224	100.0%

Race	Number	Percent
Caucasian	107	50.2%
African-American	61	28.6%
Hispanic	14	6.6%
Other	31	14.6%
No Response	*15*	
Total Responding	213	100.0%

Educational Level	Number	Percent
Not High School Graduate	53	23.5%
High School Graduate / GED	82	36.3%
Some College	78	34.5%
College Degree or Higher	13	5.8%
No Response	*2*	
Total Responding	226	100.0%

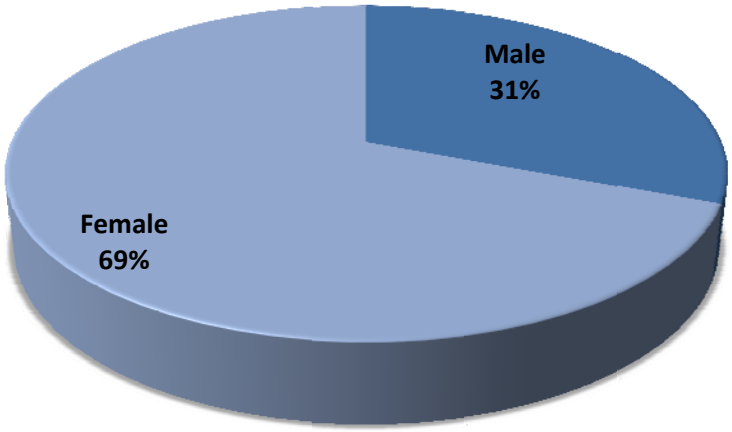
Household Annual Income	Number	Percent
Under $10,000	81	42.4%
$10,000 - $20,000	49	25.7%
$20,000 - $30,000	18	9.4%
$30,000 - $40,000	16	8.4%
$40,000 - $50,000	13	6.8%
Over $50,000	14	7.3%
No Response	*37*	
Total Responding	191	100.0%

Frequency of Ridership (D&R)	Number	Percent
Less than once a month	18	8.1%
Once or twice a month	60	26.9%
1 day a week	36	16.1%
2-3 days a week	57	25.6%
4 or more days a week	52	23.3%
No Response	*5*	
Total Responding	223	100.0%

Frequency of Ridership (FR)	Number	Percent
Less than once a month	27	13.6%
Once or twice a month	13	6.6%
1 day a week	46	23.2%
2-3 days a week	31	15.7%
4 or more days a week	81	40.9%
No Response	*30*	
Total Responding	198	100.0%

Gender

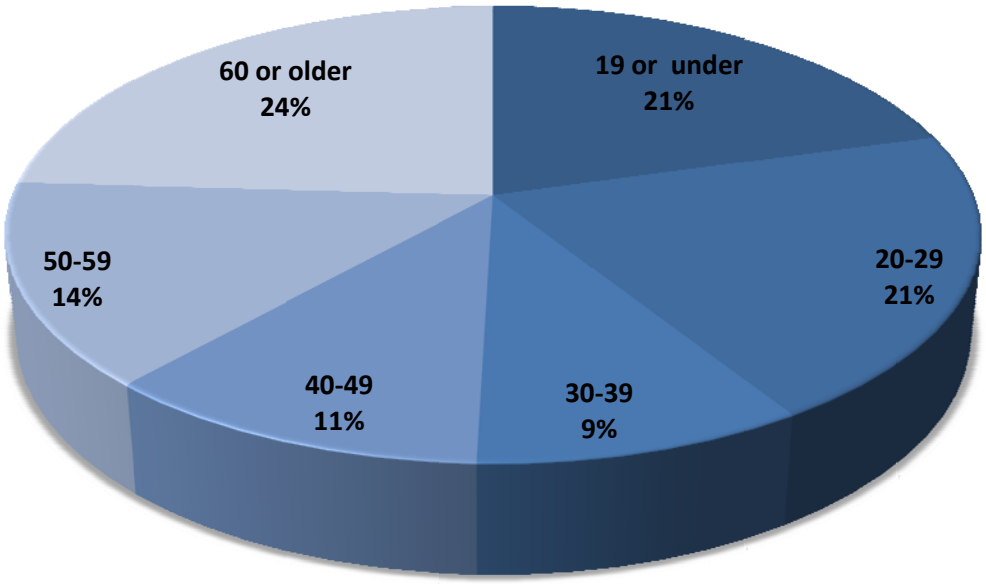
Figure E-14. Survey Results: Gender



As **Figure E-14** shows, female passengers outnumber male passengers by about a 2:1 margin (69% to 31%).

Age

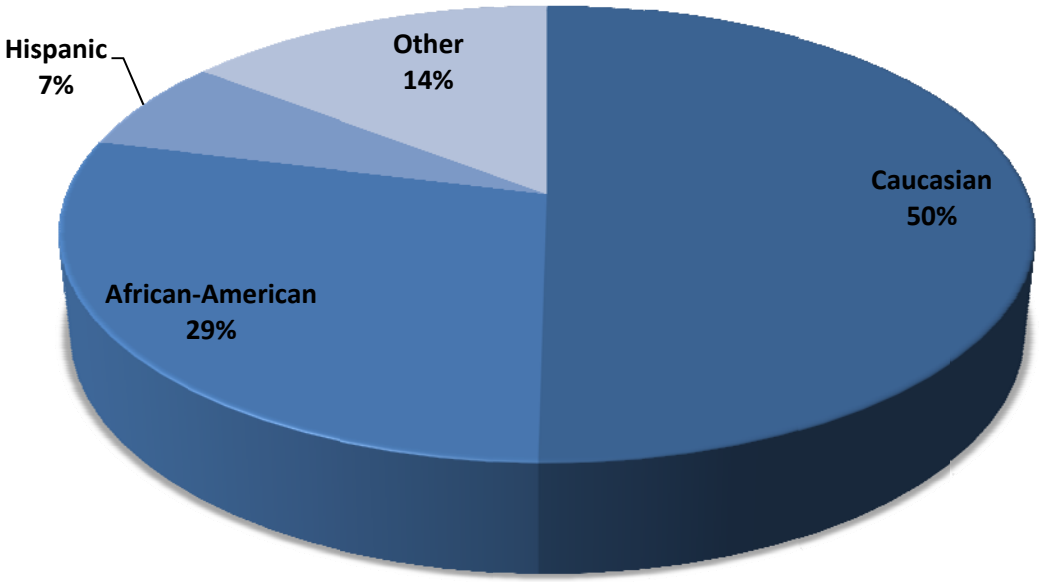
Figure E-15. Survey Results: Age



The passengers' ages are relatively well-distributed across each of the different ranges which were defined. However, based on the ridership survey results, the users are slightly skewed towards the age groups less than 30 and greater than 50. The highest single percentage for any of the age categories was over 60, making up about 24% of all respondents. **These survey responses tend to indicate that the RADAR fixed-route operations is providing basic mobility services to a broad cross-section of the service area population and is not as some might perceive it to be a system transporting only elderly residents.**

Race

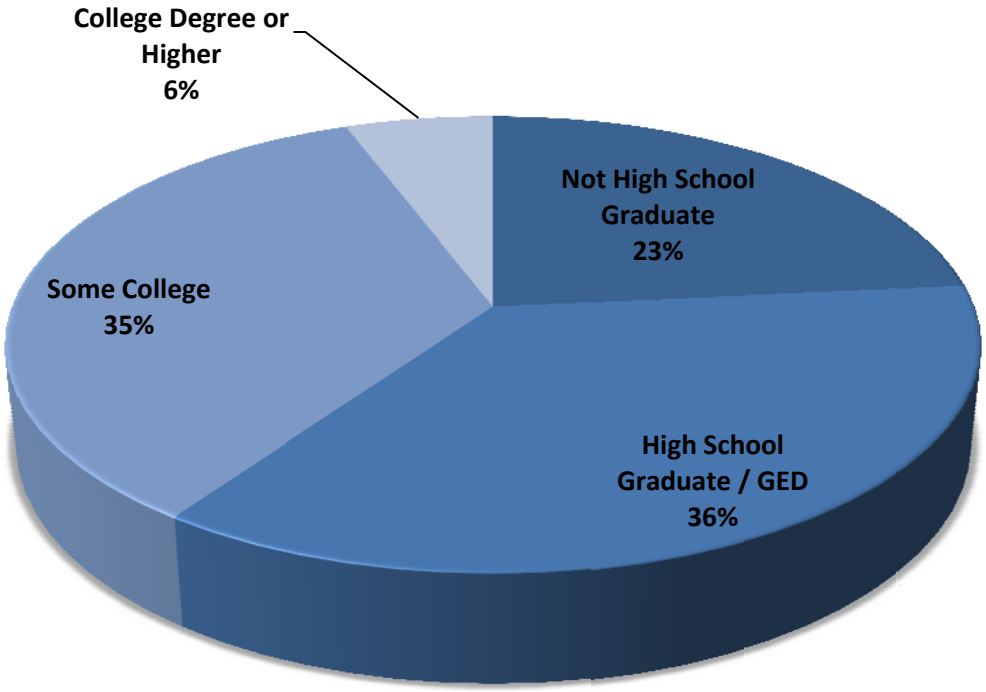
Figure E-16. Survey Results: Race



African-American and Caucasian are the top two races using RADAR Transit service. The combined percentage of these two races is almost 79% with about 50% being Caucasian and about 29% being African-American. Hispanic and Other races represented approximately 21% of the reported ridership.

Education Level

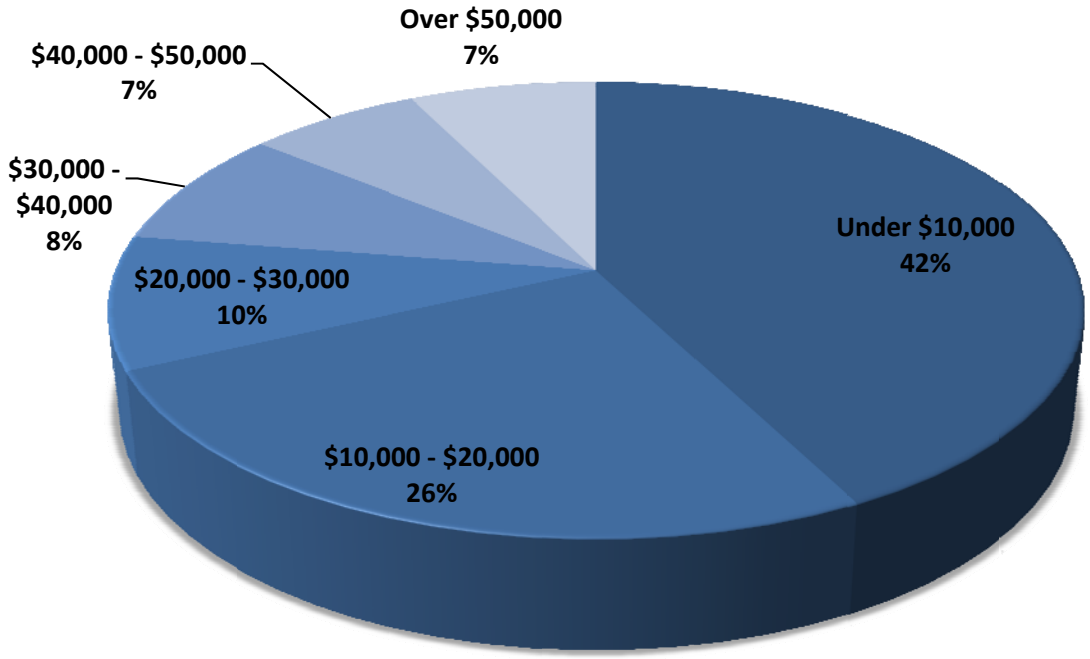
Figure E-17. Survey Results: Education Level



With respect to the reported educational level, almost 60% of the passengers indicated that they either possessed a high school degree (36.3%) or had not graduated from high school (23.5%). About 35% of the riders reported having attended some college while almost 6% reported having earned at least a collegiate level bachelor's degree.

Annual Household Income

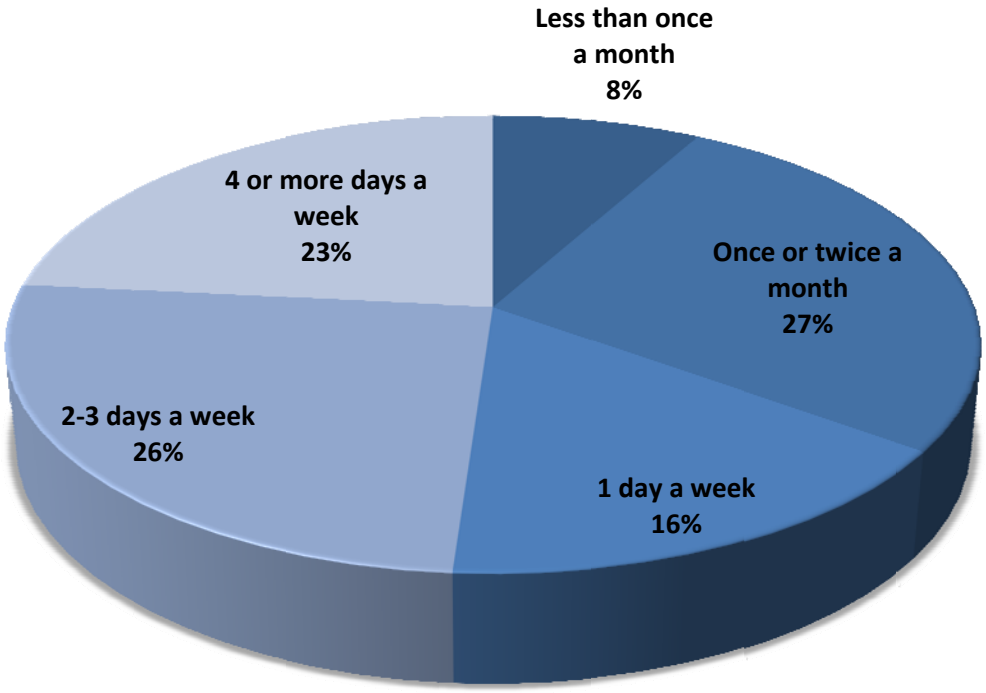
Figure E-18. Survey Results: Annual Household Income



Members of the low income population are the major users of the RADAR fixed-route services. A total of 68% of the RADAR fixed-route service passengers reported less than $20,000 for their household annual income with about 42% of the passengers reporting a household income level of less than $10,000 per year. About 10% of riders reported an annual income of between $20,000 and $30,000 while an additional 8% reported annual incomes between $30,000 and $40,000 per year. Those reporting annual household income levels of between $40,000 and $50,000 were about 7% of the total ridership while those with reported incomes of over $50,000 per year were about 7%. **Even with the high degree of non respondents, it would appear that the system is transporting persons representing all of the income levels found in the RADAR fixed-route service area.**

Frequency of Ridership

Figure E-19. Survey Results: Frequency of Ridership



Most of the people who participated in this survey reported using the RADAR fixed-route services on a regular basis. A total of about 23% of the riders reported a ridership frequency of 4 or more days a week, with an additional 26% reporting use of the system 2-3 days a week. Combining these two values indicates that about 49% of the total passengers surveyed use the RADAR fixed-route services more than two days per week and can thus be classified as "regular" rather than occasional riders. **This high level of repeat ridership further indicates that the RADAR fixed-route service component is providing an essential mobility service to a broad cross-section of people.**

E.5.2 TRIP-SPECIFIC SURVEY RESULTS – Fixed Route

Summary. **Table E-7** summarizes the responses to the on-board survey questions related to the trip being made at the time of the administration of the survey.

Table E-7 About Your Trip Today – Fixed Route Services

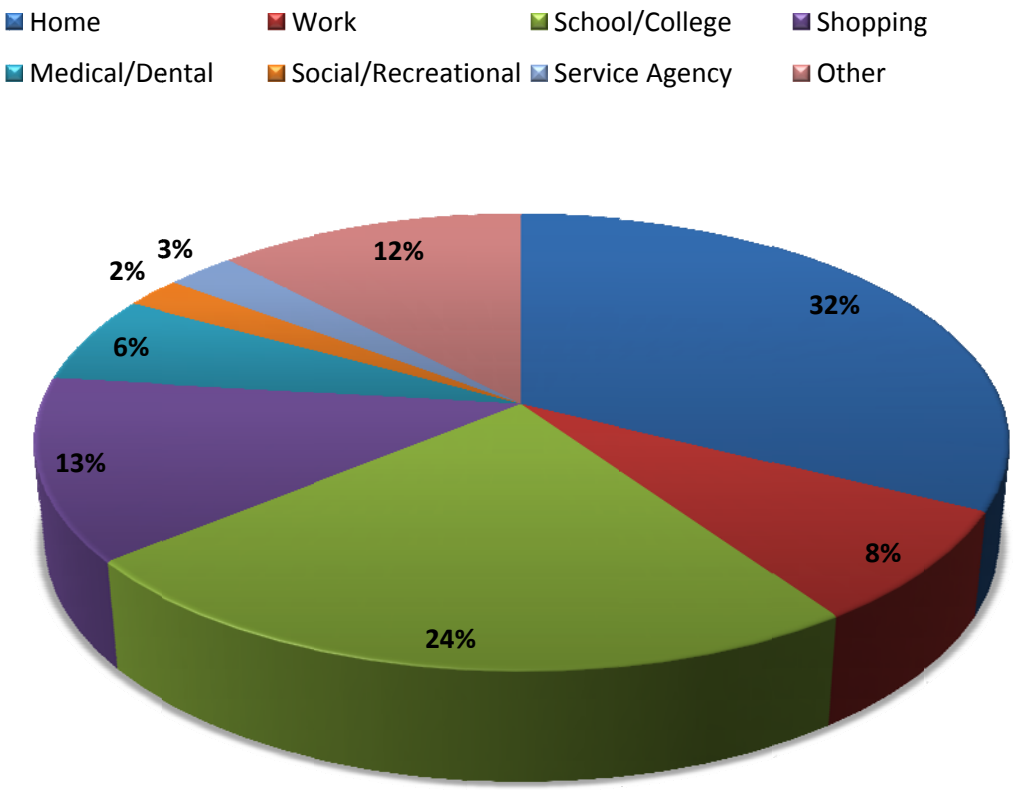
Trip Origin Type	Number	Percent
Home	73	32.4%
Work	18	8.0%
School/College	53	23.6%
Shopping	29	12.9%
Medical/Dental	14	6.2%
Social/Recreational	5	2.2%
Service Agency	6	2.7%
Other	27	12.0%
No Response	*3*	
Total Responding	225	100.0%

Trip Destination Type	Number	Percent
Home	49	21.9%
Work	22	9.8%
School/College	16	7.1%
Shopping	81	36.2%
Medical/Dental	19	8.5%
Social/Recreational	9	4.0%
Service Agency	2	0.9%
Other	26	11.6%
No Response	*4*	
Total Responding	224	100.0%

Reason for Riding	Number	Percent
Don't have a car	155	68.3%
Car not available	32	14.1%
Prefer to ride bus	16	7.0%
To save time	5	2.2%
To save money	8	3.5%
Disability/unable to drive	7	3.1%
Other	4	1.8%
No Response	*1*	
Total Responding	227	100.0%

Trip Origin

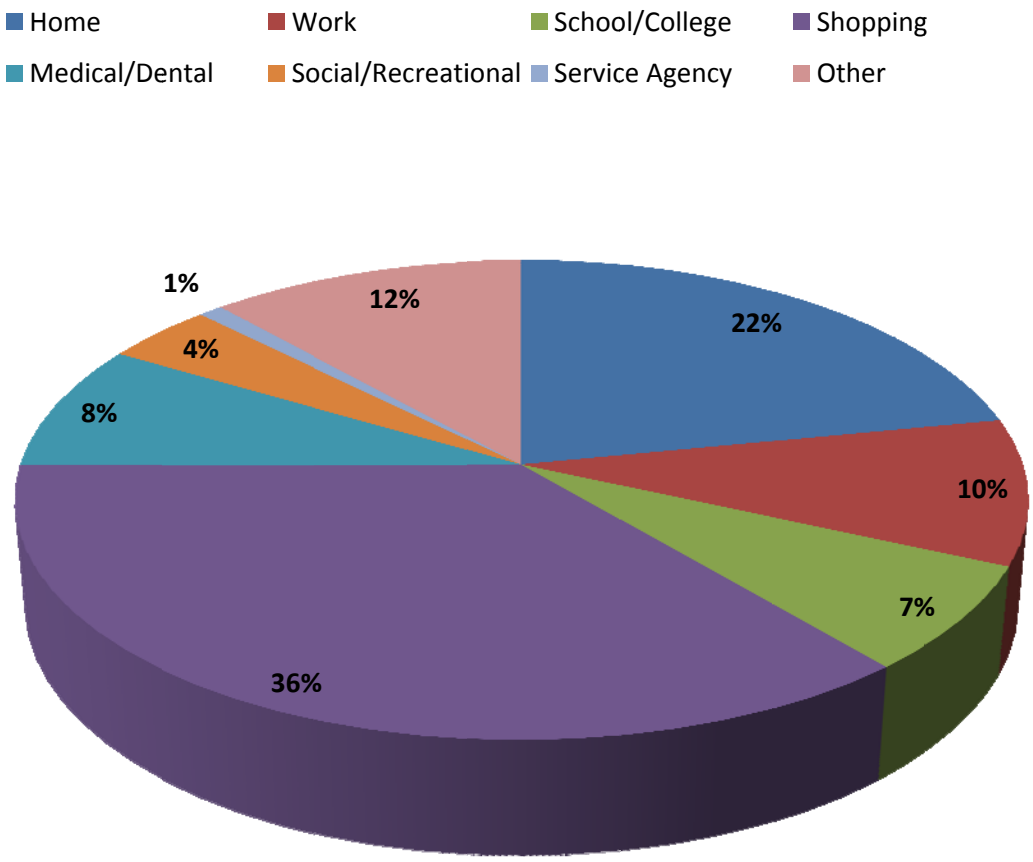
Figure E-20. Survey Results: Trip Origin



As shown in Figure E-20 and Table E-7, the greatest number (32.4%) of the passengers started their trips from their home. About 24% of the passengers reported starting their trips from "School or College". The three next most frequent trip origins were cited as being "Shopping" (12.9%), "Other" (12.0%), and "Work" (8.0%).

Trip Destination

Figure E-21. Survey Results: Trip Destination



The top four trip destinations were noted as being ”Shopping” at 36.2%, “Home” at 21.9%, ”Other” at 11.6%, and ”Work” at 9.8%. These four destinations account for 79.5% of the total trips. **These results demonstrate that the current ridership is most often using the RADAR fixed-route services for basic mobility purposes between their homes and their workplace or other important destinations.**

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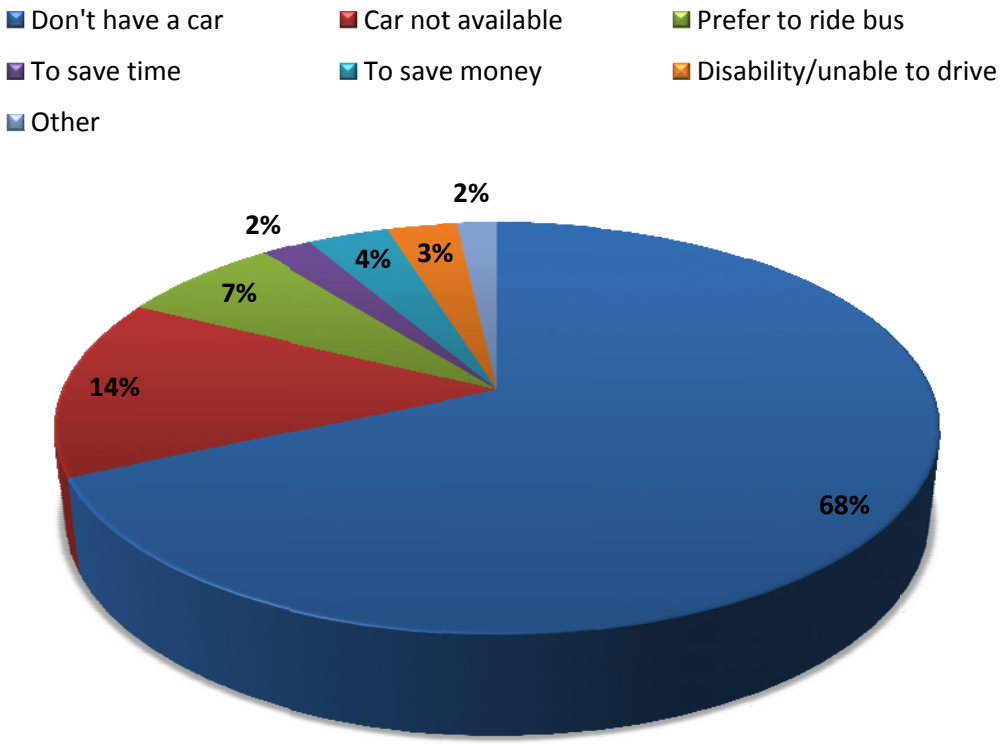
Reason for Riding Transit

Figure E-22. Survey Results: Reason for Riding Transit



When asked to identify the principal reason why they were riding the bus, survey respondents most frequently indicated that they "Did Not Have a Car" (68.3%) or that a "Car Was Not Available" (14.1%). Combined, these two responses accounted for 82.4% of the reasons for using the RADAR fixed-route service.

These responses would appear to indicate that the current ridership can be classified as "transit captives"; that is, they have few if any other travel options available and if the current transit service was not provided, the subject trip would probably not be made. With a large percentage of the trips being for work, shopping, or medical/dental purposes this lack of basic mobility could result in significant negative effects on the ability of the study area population to obtain meaningful employment or necessary medical services.

E.5.3 SERVICE RATINGS SURVEY RESULTS – Fixed Route

Figure E-23 and **Table E-8** summarizes the responses of the Fixed-Route service passengers to those survey questions that sought to obtain the view of the current riders as to quality of service currently being offered. The service factors presented for rating were as follows:

- Bus on-time performance
- Hours of bus service
- Cost of bus fare
- Sense of security on the buses
- Cleanliness of buses
- Courtesy/friendliness of bus drivers, and
- Overall Service rating

Figure E-23. Survey Results: Service Ratings

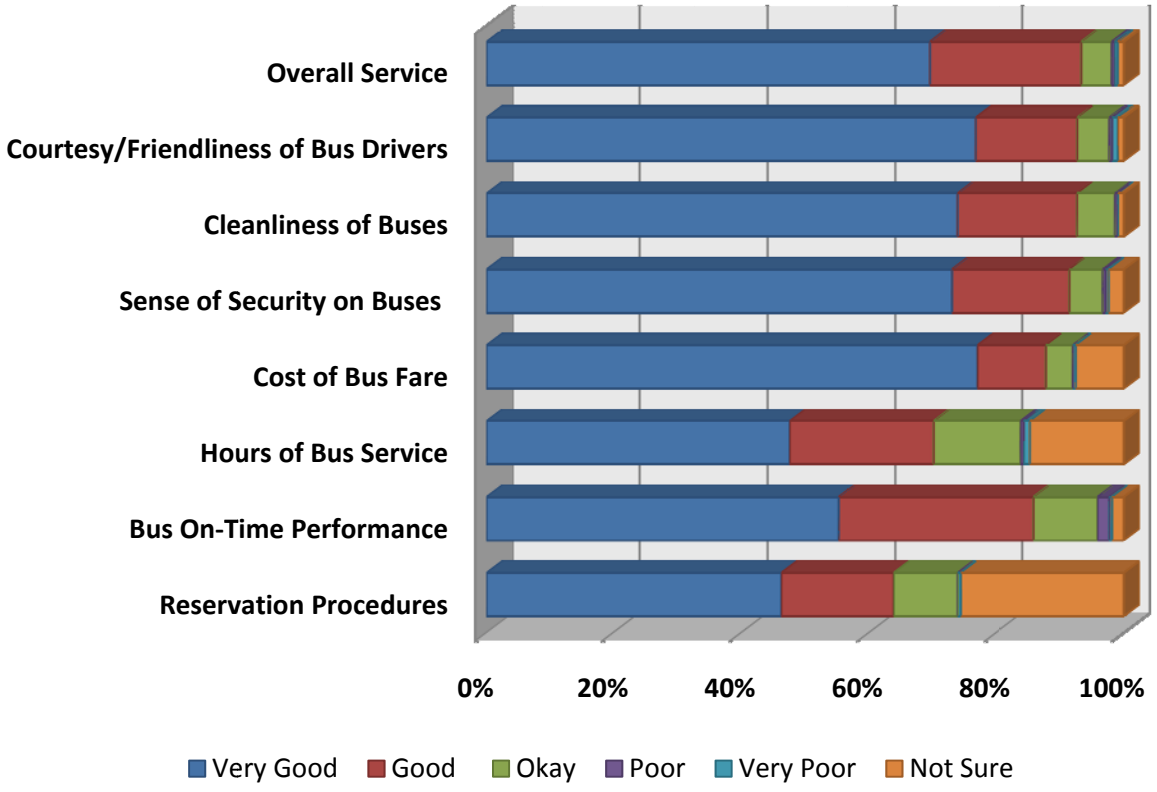


Table E-8. Survey Results: Service Ratings

Reservation Procedures	Number	Percent
Very Good	92	46.2%
Good	35	17.6%
Okay	20	10.1%
Poor	0	0.0%
Very Poor	1	0.5%
Not Sure	51	25.6%
No Response	*29*	
Total Responding	199	100.0%

Sense of security on buses	Number	Percent
Very Good	154	73.0%
Good	39	18.5%
Okay	11	5.2%
Poor	1	0.5%
Very Poor	1	0.5%
Not Sure	5	2.4%
No Response	*17*	
Total Responding	211	100.0%

Bus on-time performance	Number	Percent
Very Good	121	55.3%
Good	67	30.6%
Okay	22	10.0%
Poor	4	1.8%
Very Poor	1	0.5%
Not Sure	4	1.8%
No Response	*9*	
Total Responding	219	100.0%

Cleanliness of buses	Number	Percent
Very Good	161	73.9%
Good	41	18.8%
Okay	13	6.0%
Poor	1	0.5%
Very Poor	0	0.0%
Not Sure	2	0.9%
No Response	*10*	
Total Responding	218	100.0%

Hours of bus service	Number	Percent
Very Good	97	47.5%
Good	46	22.5%
Okay	28	13.7%
Poor	1	0.5%
Very Poor	2	1.0%
Not Sure	30	14.7%
No Response	*24*	
Total Responding	204	100.0%

Courtesy/ Friendliness of bus drivers	Number	Percent
Very Good	168	76.7%
Good	35	16.0%
Okay	11	5.0%
Poor	1	0.5%
Very Poor	2	0.9%
Not Sure	2	0.9%
No Response	*9*	
Total Responding	219	100.0%

Cost of bus fare	Number	Percent
Very Good	164	77.0%
Good	23	10.8%
Okay	9	4.2%
Poor	0	0.0%
Very Poor	1	0.5%
Not Sure	16	7.5%
No Response	*15*	
Total Responding	213	100.0%

Overall service	Number	Percent
Very Good	146	69.5%
Good	50	23.8%
Okay	10	4.8%
Poor	1	0.5%
Very Poor	1	0.5%
Not Sure	2	1.0%
No Response	*18*	
Total Responding	210	100.0%

For each of these eight evaluation measurements, the responses from the riders provided combined ratings of "Very Good" or "Good" in the range of 64-93% for every measurement. The highest positive service factor ratings were for "Courtesy/Friendliness of Bus Drivers" with 76.7% "Very Good", 16.0% "Good", and 5.2% "Okay" for a total of 97.7% total positive rating and for "Cleanliness of Buses " with 73.9% "Very Good", 18.8% "Good", and 5.7% "Okay" for a total of 98.4% total positive rating.

The "Overall Service" rating for the RADAR fixed-route service was 69.5% "Very Good", 23.8% "Good", and 4.8% "Okay" for a combined total of 90.3% positive. Approximately 1% of the riders rated the current service as "Poor" or "Very Poor".

These findings represent a positive reaction from the passengers of RADAR. They also indicate that the users are satisfied with the overall services that the RADAR fixed-route / fixed-schedule service provides.

E.5.4 FUTURE SERVICE IMPROVEMENTS SURVEY RESULTS – Fixed Route

Figure E-24 and Table E-9 summarize the responses to those survey questions that sought to obtain the view of the current riders as to the importance of a number of potential service improvements that RADAR might wish to consider for its current fixed-route operations. The suggested areas of potential service improvement were:

- Expand hours/days of service
- Improve security on the busses
- Less advanced time for scheduling trip

Figure E-24. Survey Results: Future Service Improvements

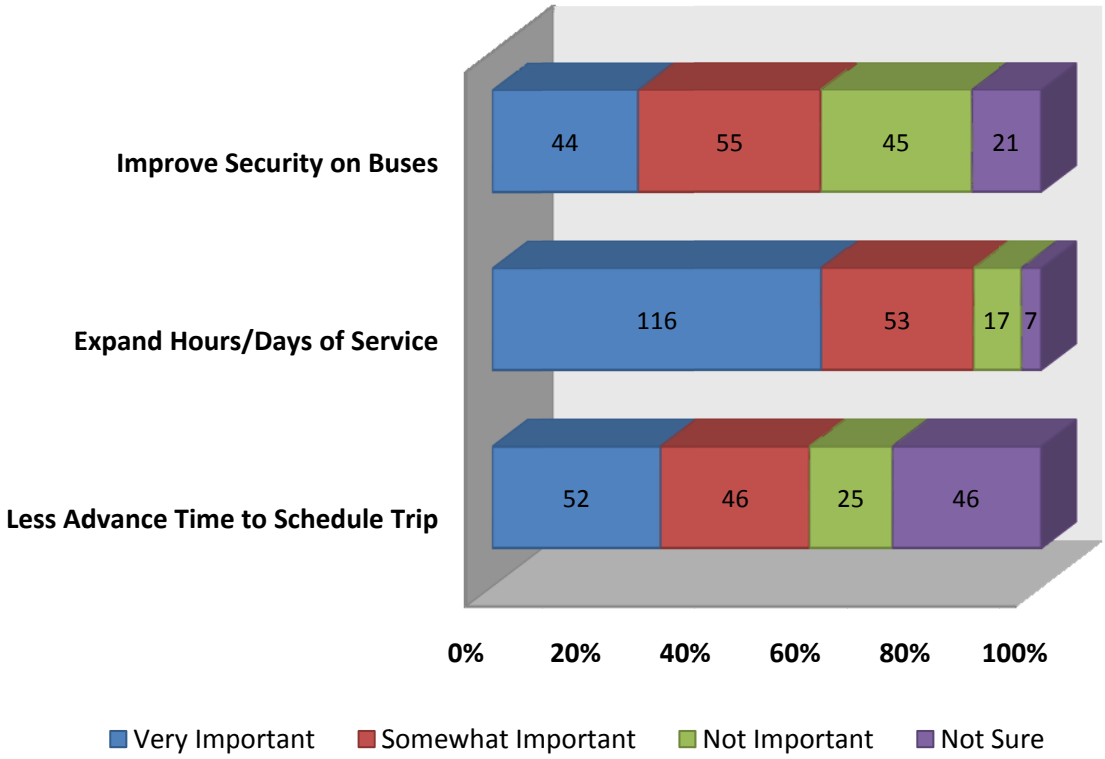


Table E-9 Improvements Needed – Fixed-Route Services

Less advance time to schedule trip	Number	Percent
Very Important	52	30.8%
Somewhat Important	46	27.2%
Not Important	25	14.8%
Not Sure	46	27.2%
No Response	*59*	
Total Responding	169	100.0%

Improve security on buses	Number	Percent
Very Important	44	26.7%
Somewhat Important	55	33.3%
Not Important	45	27.3%
Not Sure	21	12.7%
No Response	*63*	
Total Responding	165	100.0%

Expand hours/ days of service	Number	Percent
Very Important	116	60.1%
Somewhat Important	53	27.5%
Not Important	17	8.8%
Not Sure	7	3.6%
No Response	*35*	
Total Responding	193	100.0%

With respect to "Expand Hours/days of Service", 60.1% of respondents viewed this as being "Very Important" while an additional 27.5% viewed this as being "Somewhat Important" for a combined importance rating of 87.6%. Conversely, only 8.8% of the respondents rated this as being "Not Important."

With respect to "Improved Security on the buses", 26.7% of respondents viewed this as being "Very Important" while an additional 33.3% viewed this as being "Somewhat Important" for a combined importance rating of 60%. Conversely, only 27.3% of the respondents rated this as being "Not Important."

With respect to "Less Advanced Time to Schedule a Trip" 30.8% of respondents viewed this as being "Very Important" while an additional 27.2% viewed this as being "Somewhat Important" for a combined importance rating of 58%. Conversely, only 14.8% of the respondents rated this as being "Not Important."

On-Board Ridership Survey (Demand Response Operation) - Data Input Sheet
System Name: RADAR
Survey Date: 2/24/09 ~ 2/26/09
Note: "0" or "Blank" = No Response to question

			About You								About Your Trip Today										Service Characteristics Rating											Future Improvement Needs							Comment
System ID (01-06)	Serial Number (1001 or greater)	Route or Service Area	Boarding Time	Sex (1-2)	Age (1-6)	Race (1-4)	Education (1-4)	Household Income (1-6)	Ride Frequency (1-5)	Ride Frequency of Door to Door Service (1-5)	Trip Origin (Type 1-8)	Trip Origin (Place)	Access Mode (1-4)	Destination (Type 1-8)	Destination (Place)	Ride Reason (1-7)	Frequency (1-6)	Areas Served (1-6)	Bus On-time (1-6)	Hours of Service (1-6)	Info Availability (1-6)	Bus Fare (1-6)	Security (1-6)	Cleanliness (1-6)	Courtesy (1-6)	Overall Rating (1-6)	More frequent (1-4)	Direct Routing (1-4)	Later service (1-4)	Expand Service (1-4)	Improve Security (1-4)	Bike Racks (1-4)	Other (1-4)	
5	1012	Star	2/24/09 8:34	1	6	2	1	1	5	0	1	Home	1	6	St. Elias Church	7	2	2	1	2	2	2	1	2	2	2	1	1	3	1	1	3	0	
5	1013	Star	2/24/09 10:00	1	6	1	3	3	4	0	1	Salem	1	6	St. Elias Church	2	2	2	2	2	2	3	2	2	1	2	1	1	3	1	1	3	0	
5	1014	Star	2/24/09 10:40	2	6	1	2	3	2	0	1	Northeast Rke,off Wmson rd	1	5	Lewis Gale Clinic	2	2	2	2	2	3	2	2	2	2	1	1	1	3	3	3	3	0	
5	1015	Star	2/24/09 14:00	2	5	1	4	1	5	0	6	Salem	1	1	Clearview Manor	6	1	2	1	2	2	3	1	1	1	2	1	1	1	1	2	3	0	
5	1016	Star	2/24/09 15:00	1	5	2	4	2	2	0	5	707 Building	1	1	10Th St. NE	6	1	2	1	1	3	1	1	1	2	1	2	2	3	4	3	3	0	
5	1017	Star	2/24/09 15:45	1	6	1	1	2	4	0	6	St Elias Church	1	0	Courtney NE Rke	1	1	2	2	2	1	2	2	2	2	2	2	2	3	3	2	2	0	
5	1018	Star	2/25/09 9:00	1	6	1	4	2	5	0	1	Gradin Rd area	1	6	YMCA	1	1	2	3	2	2	2	1	1	2	1	1	3	1	3	3	3	0	
5	1019	Star	2/25/09 10:00	2	6	1	1	1	5	0	4	Crossroads Kmart	1	1	Steringwood	1	2	2	1	2	2	1	2	2	1	1	1	1	3	1	3	3	0	
5	1020	Star	2/25/09 11:30	2	6	1	3	0	3	0	4	Walmart	1	1	Cleveland Ave, Salem	1	2	1	1	2	2	2	2	2	1	1	2	2	3	3	3	3	0	
5	1021	Star	2/25/09 13:00	1	6	1	4	3	4	0	8	BB&T/McDonalds	1	1	Kimball Ave, Salem	6	2	2	2	3	2	2	2	2	2	2	1	1	2	1	3	3	0	
5	1022	Star	2/25/09 14:00	2	5	1	3	2	5	0	2	Skyline Cleaners	1	5	RM Hospital	6	2	2	2	3	2	2	0	1	1	2	1	2	1	1	1	3	3	0	
5	1023	Star	2/25/09 14:40	1	6	2	3	1	4	0	5	Comm Hospital	1	1	Melrose Towers	1	2	2	1	2	2	2	2	2	1	1	2	2	3	1	2	3	0	
5	1027	Star	2/24/09 9:01	2	6	1	3	4	4	0	1	Salem	1	5	2021 Apperson Dr.	6	1	1	2	2	3	2	2	2	2	1	3	2	3	1	2	3	1	
5	1028	Star	2/24/09 10:13	1	5	1	1	1	2	0	5	Salem	4	8	shenandoah Salem	6	2	2	2	1	1	2	1	2	1	1	3	3	3	2	3	4	0	
5	1030	Star	2/24/09 12:23	1	5	1	1	4	2	0	1	3212 Countland Av	4	5	1502 Wilso Rd Roanoke	3	1	2	2	1	1	2	2	2	1	2	3	2	3	1	3	4	1	
5	1031	Star	2/26/2009	1	0	0	0	0	0	0	0	2728 colonial Ave	0	0	1222 Salem Ave	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Angela Rescheduled /no show
5	1032	Star	2/24/09 13:14	2	6	2	1	4	5	0	1	2028 Orange Ave	4	5	1030 Jefferson St	6	1	1	1	1	3	2	1	4	2	2	3	3	3	2	3	4	0	
5	1036	Star	2/25/09 8:20	1	6	1	3	0	4	0	1	1913 Kiska Rd/Salem	4	5	St. Elias Church	6	1	3	1	1	2	2	2	3	1	0	3	3	4	2	3	4	0	
5	1037	Star	2/25/09 9:28	2	2	1	1	0	4	0	1	2648 Jackson Dr./Salem	4	8	2112 Grandin Rd/Roanoke City	6	2	2	2	2	2	2	2	3	1	2	3	3	3	2	3	4	0	
5	1038	Star	2/25/09 10:36	2	6	1	2	2	2	0	1	2311 Broadway /Roanoke	1	2	Candail Av/Roanoke	1	2	3	2	2	2	2	2	3	4	1	2	2	1	3	1	3	4	0	
5	1039	Star	2/25/09 11:24	2	6	1	4	3	4	0	1	840 Red Lane /Salem	1	8	Williamson Rd /Hershberger	1	1	1	1	2	2	2	3	4	1	2	2	3	3	1	3	4	1	
5	1040	Star	2/25/09 13:27	1	2	4	3	0	4	0	1	845 Woodsend Ln/Roanoke	4	8	4508 Starkley Rd	6	2	2	1	1	2	2	2	3	1	2	2	2	3	2	3	4	0	
5	1041	Star	2/25/09 15:05	2	5	1	4	3	1	0	5	Salem	4	1	0	6	2	4	2	2	2	2	3	3	1	2	2	2	4	1	2	2	0	
5	1042	Star	2/24/09 8:50	1	6	2	4	6	5	0	1	3046 Linwood Rd/Roanoke	1	2	VA Med Ctr	6	2	3	2	3	3	2	2	2	1	2	2	2	1	1	2	3	0	Later Schedules/evening is good
5	1044	Star	2/24/09 12:50	1	5	1	2	1	5	0	1	Melrose Ave	4	8	Roanoke Blvd	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	Later Schedules
5	1045	Star	2/24/09 14:30	2	2	2	2	1	5	0	1	1450 Guildhall Ave. NW	1	8	S. Jefferson St	6	2	2	2	2	2	3	2	2	2	2	1	1	1	1	1	1	0	
5	1046	Star	2/24/09 15:00	1	5	1	3	1	5	0	8	Roanoke	1	1	Stafford Park	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	0	
5	1047	Star	2/24/09 15:50	1	5	2	2	4	5	0	2	Salem	1	1	2411 Embassy DM	2	2	4	3	0	1	2	1	1	2	1	0	3	1	1	1	1	1	more chocies
5	1049	Star	2/25/09 10:00	1	4	1	2	2	4	0	1	Hershberger	1	8	Williams Rd	1	1	6	1	1	1	1	1	1	1	1	2	3	3	3	1	4	0	
5	1050	Star	2/25/09 9:30	1	5	1	2	2	5	0	8	13th St	4	8	McClenahan	6	1	2	1	1	1	1	1	1	1	1	2	2	1	1	1	2	0	
5	1051	Star	2/25/09 8:30	2	3	1	4	0	5	0	8	Roanoke City	4	8	Roanoke city	1	1	4	1	2	4	1	1	1	1	0	1	1	2	1	1	4	0	Bad experience with a driver
5	1052	Star	2/25/09 12:30	2	6	1	2	2	4	0	4	Valley View	1	1	1409 Morehead Ave. Roanoke	1	1	3	1	1	3	1	1	1	1	1	2	2	3	4	4	4	0	
5	1053	Star	2/25/09 13:30	2	5	2	2	1	5	0	8	Melrose Ave	4	8	Stocky rd	1	1	2	1	3	2	1	1	1	1	1	1	2	1	2	1	4	0	
5	1054	Star	2/25/09 14:30	2	1	2	2	1	4	0	1	Salem	1	2	friendship Manor	1	3	3	1	1	1	1	1	1	1	0	1	1	2	3	1	4	0	
5	1055	Star	2/25/09 15:00	2	6	1	2	2	5	0	2	Melrose Goodwill	1	1	Strafford Park	1	2	2	1	3	3	1	1	1	1	0	1	2	1	1	1	4	0	
5	1067	Star	2/25/09 11:15	2	2	1	4	6	4	0	5	McClanahan Building	1	1	Roanoke St/Salem	6	2	4	2	2	1	2	2	2	2	2	2	3	1	1	1	3	0	
5	1068	Star	2/25/09 12:25	2	6	4	2	2	4	0	5	Franklin Rd, Roanoke	1	1	North east Spring St	5	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	0	
5	1071	Star	2/25/09 15:17	2	6	1	3	1	4	0	5	Lewis Gale	1	1	Morningside Manor/Vinton	6	5	5	5	5	5	1	1	0	2	1	1	2	1	1	2	4	0	
5	1094	Star	2/26/09 8:47	1	6	1	1	0	5	0	1	1403 Brusky Mtn Rd Salem	4	5	Cove Rd Roanoke	6	1	2	1	1	1	1	2	1	1	1	2	2	3	2	3	4	0	
5	1095	Star	2/26/09 9:54	2	6	1	2	0	5	0	1	2746 Tillit Ave SW Roanoke	1	5	Roanoke Medical Rehab	1	2	3	2	2	2	2	3	1	1	2	2	2	3	2	3	4	0	
5	1096	Star	2/26/2009	2	2	0	0	0	0	0	0		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Did survey yesterday
5	1097	Star	2/26/09 11:01	1	0	1	0	0	0	0	6	YMCA salem	1	8	4920 Woodmar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Didn't want to do survey
5	1098	Star	2/26/09 11:32	1	6	1	3	5	4	0	1	5207 woodbury/Williamson rd	1	8	H & R BlockValley Mall	6	2	2	2	2	2	2	3	1	1	2	2	2	3	3	3	4	0	
5	1099	Star	2/26/09 12:45	2	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No Show
5	1102	Star	2/25/09 17:00	1	6	1	3	4	4	0	1	Pheasant Ridge	4	8	344 Church Ave	7	1	1	1	1	1	1	1	1	1	1	2	2	3	2	2	3	1	Sunday service
5	1103	Star	2/26/09 8:45	2	4	2	3	1	4	0	1	1006 Crescent st NW	1	5	Valley view Blvd	1	1	6	1	4	6	3	3	3	2	3	1	1	1	1	1	4	0	need receipts for travel/signs
5	1104	Star	2/26/09 9:05	2	6	1	2	3	4	0	1	Salem	4	5	Lewis Gale Clinic	1	1	6	1	1	2	1	1	1	1	1	1	1	1	1	1	4	0	
5	1105	Star	2/26/09 9:30	1	6	2	2	2	4	0	1	4718 Desi	1	5	Salem	6	1	2	2	1	2	1	1	1	1	1	1	1	3	4	4	4	0	
5	1106	Star	2/26/09 10:20	2	2	1	2	1	5	0	1	Jackson dr/Salem	4	5	Salem	6	1	2	1	1	2	1	1	1	1	1	2	2	2	2	2	2	0	
5	1107	Star	2/26/09 11:15	2	6	1	1	1	4	0	1	Buena Vista	1	4	Vinton	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	4	0	
5	1108	Star	2/26/09 13:20	2	6	1	3	4	3	0	4	Salem	1	1	1941 Braeburn	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	0	
5	1111	Star	2/25/2009	1	6	1	0	0	5	0	8	St Elias Roanoke	4	1	Russian Mt Salem	6	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	1117	Star	2/24/09 8:30	1	4	2	3	0	2	0	1	Wm Fleming High school	1	5	Wmson Rd	2	3	3	3	3	3	3	3	2	2	3	1	3	3	2	2	3	0	
5	1118	Star	2/24/09 10:26	2	0	2	0	0	4	0	5	Apperson dr	1	1	Countryside rd	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	3	0	suggeston box on all buses
5	1119	Star	2/24/09 12:30	1	0	1	0	0	5	0	5	LGMH	4	1	Howbert Dr	6	1	1	1	2	1	1	2	1	1	1	2	2	1	1	0	2	0	Weekend service
5	1120	Star	2/24/09 13:30	2	0	1	4	0	5	0	6	Greene Mem Methodist Church	1	1	Sheffield Rd	2	1	1	1	1	1	1	1	1	1	1	2	2	1	2	2	3	1	Weekend service Warm buses
5	1121	Star	2/24/09 15:00	1	5	1	0	0	4	0	5	VA Hospital	1	1	Narcissus St/ Salem	2	2	2	2	2	2	2	2	2	2	2	1	2	2	1	2	4	1	snacks on bus
5	1122	Star	2/24/09 15:45	1	0	4	0	0	4	0	5	7th St Fresius Ctr	1	1	The ridge Apartments	2	1	1	1	1	1	1	1	1	1	1	3	2	3	1	3	3	0	
5	1123	Star	2/24/09 17:05	2	0	1	0	0	5	0	5	Crystal Spring Ave	1	1	Vinton	2	2	2	3	2	2	2	3	2	4	2	2	2	2	2	1	3	1	warm buses/softer ride
5	1128	Star		1	0	1	0	0	5	0	5	VA Hospital	1	1	Hillcrest Dr	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	
5	1139	Star	2/26/09 16:12	2	5	2	4	2	5	0	5	Burrell Mem Hosp	1	1	1020 13th St Roanoke	1	2	3	2	2	3	2	3	1	1	2	2	2	3	2	3	4	0	
5	1024	Cortran	2/26/09 8:30	1	3	2	4	6	4	0	1	Cherokee Hills	1	5	freesenius Healthcare	6	1	1	2	1	2	1	1	2	2	1	2	2	3	3	3	0	
5	1025	Section 18 (Cortran)	2/26/09 11:00	1	4	1	2	6	4	0	1	Bent Mt.	4	6	Cave Spring Area	6	1	1	1	3	1	1	1	1	1	1	1	2	1	1	3	3	1	

5	1026	Cortran	2/26/09 12:00	1	6	1	3	4	5	0	6	RAC	1	1	Falls off Peterscreek	6	1	1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	0	
5	1029	Cortran	2/24/09 11:00	2	0	2	0	0	0	0	5	Cataba Hospital	1	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Did not want to do survey.
5	1033	Cortran	2/26/09 14:24	1	4	1	1	3	4	0	5	Shenandoah Ave	1	1	Roanoke City	2	1	1	1	1	2	2	2	3	1	2	1	2	3	3	0	4	1	
5	1034	Cortran	2/24/09 15:57	2	2	1	2	0	5	0	3	Colonial Ave/Roanoke	1	8	Roanoke	0	1	1	1	1	1	1	1	2	1	1	3	3	4	2	3	4	0	
5	1035	Cortran	2/24/09 17:00	1	0	1	1	0	5	0	2	Krogers Tower Shopping Ctr	0	1	Roanoke	6	1	1	1	1	1	1	1	2	1	1	3	3	4	2	3	4	0	
5	1043	Cortran	2/24/09 10:25	2	2	4	2	1	4	0	2	110 Franklin St	1	1	Northlakes/Peter Creek Rd	1	1	3	1	3	3	3	3	1	1	1	4	1	3	0	3	3	0	
5	1048	Cortran	2/24/09 16:40	1	5	1	2	6	5	0	8	Old Mt. Road	4	1	Old Mt. Road	6	1	1	4	4	1	1	1	1	1	1	2	2	1	1	0	2	0	
5	1057	Cortran	2/24/09 8:55	2	6	1	2	3	2	0	5	Vinton	1	5	rt 2001 Crystal Springs	6	1	1	1	1	1	1	1	1	1	1	4	4	4	4	4	4	4	
5	1058	Cortran	2/24/29 10:30	2	5	1	3	3	5	0	1	Tamarine Dr.	1	2	Berkshire Nursing Home	6	2	6	2	2	4	3	2	2	2	2	1	1	1	3	1	0	1	
5	1059	Cortran	2/24/09 11:05	1	5	1	1	4	4	0	1	3127 Jay Valley Rd	1	2	Towers Shopping Ctr	1	2	2	1	2	2	2	2	2	1	1	1	2	2	4	2	4	1	To be on time
5	1060	Cortran	2/24/09 13:00	2	6	1	1	4	3	0	8	126 W. Clevland Ave. /Vinton	1	1	5th St Vinton	6	1	1	2	1	2	2	1	1	1	0	4	4	4	4	4	4	4	
5	1061	Cortran	2/24/09 14:00	1	2	1	3	2	5	0	3	Va Western CC	4	1	Honeywood Apts. Roanoke	6	2	2	3	4	3	4	3	2	1	3	2	2	1	2	2	3	0	
5	1062	Cortran	2/24/09 14:30	1	6	1	4	3	5	0	8	Salem	1	1	Tanglewood Ln	6	2	2	1	2	2	2	1	1	1	1	1	2	3	1	4	4	0	
5	1063	Cortran	2/24/09 16:00	1	0	1	3	5	4	0	3	Va Western CC	1	1	Poor Mtn Rd / Salem	3	1	1	1	1	2	1	1	1	2	1	0	0	0	0	0	0	0	
5	1064	Cortran	2/25/09 8:00	1	3	1	2	1	5	0	1	Clarke Ave. SW Roanoke	1	2	Williamson Rd	6	2	2	2	3	2	2	2	2	1	2	1	0	2	2	3	4	4	
5	1065	Cortran	2/25/09 9:00	2	2	2	4	0	2	0	1	3131 Garst Cabin Dr. Roanoke	4	3	VA West Colonial Ave.	6	1	1	1	1	1	3	1	1	1	1	1	1	1	1	3	3	4	
5	1066	Cortran	2/25/09 9:45	1	5	1	4	2	5	0	1	Berkdell Dr. Roanoke	4	5	Va Medical Ctr/ Salem	6	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	1	Need smoother ride
5	1069	Cortran	2/25/09 13:30	1	6	1	4	0	4	0	1	4434 Electric Rd Roanoke	0	5	1919 Electric Rd Roanoke	6	1	1	1	1	2	1	1	1	1	1	3	3	3	3	3	3	1	Bus drivers more pay
5	1070	Cortran	2/25/09 14:20	2	6	1	2	0	4	0	1	3419 Londonderry Cir/Roanoke	1	5	Lewis-Gale	6	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	
5	1072	county bus/36 (Cortran)	2/25/09 9:00	1	6	1	1	6	4	0	1	County	1	8	city	1	2	2	2	2	2	2	2	2	1	1	1	1	3	1	2	3	1	#"s on bldg to find correct address
5	1073	Roanoke City/36 (Cortran)	2/25/09 13:55	2	6	1	1	1	5	0	1	Roanoke County	4	1	county	1	1	1	1	1	1	1	1	1	1	1	1	1	0	3	1	3	0	more time on pickup
5	1074	county bus/36 (Cortran)	2/25/09 14:50	2	6	1	1	2	4	0	1	county	4	1	County	1	2	2	1	2	3	2	1	1	1	1	1	1	3	3	1	1	1	
5	1093	Cortran	2/26/09 8:20	2	6	1	4	4	5	0	1	2937 View Dr. Roanoke	1	2	Wlmfiem H.S.	2	2	2	1	3	2	2	3	2	1	2	2	2	3	1	3	4	0	
5	1100	Roanoke City funded (Cortran)	2/26/09 14:00	1	1	0	0	0	0	0	0	Fishburne Elementary School	0	1	2214 Memorial Ave SW Roanoke	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cannot talk
5	1101	Cortran	2/26/09 14:47	1	0	1	0	0	0	0	4	Tanglewood shopping ctr	4	1	Rocky Rd Bent mtn	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Did survey this morning
5	1110	Cortran	2/25/09 17:30	1	6	1	4	0	5	0	2	Electric Rd/ Salem	4	1	Roanoke	6	0	2	2	2	2	3	3	3	2	2	0	0	1	0	0	0	0	Saturday Service
5	1112	Cortran	2/26/09 9:00	2	6	2	2	1	4	0	1	Roanoke Ct	4	8	Towers shopping ctr	7	2	2	2	2	2	2	2	2	2	2	1	1	3	1	2	2	2	weekend service
5	1113	Cortran	2/26/09 9:25	2	6	1	4	0	4	0	5	1121 S. Jefferson	1	5	2129 Roshed Ave	7	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	
5	1114	Cortran	2/26/09 13:20	2	6	1	2	0	1	0	8	Christian Ave. Roanoke	1	1	Chester Ave Roanoke	6	2	2	2	2	2	1	1	2	2	1	2	0	0	0	4	4	2	weekend service
5	1124	Cortran	2/25/09 9:00	2	0	2	0	0	2	0	1	Friendship Manor	0	5	Ordway Dr	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	
5	1125	Cortran	2/25/09 10:20	1	0	1	0	0	0	0	1	Poor Mtn Rd	0	3	VWCC	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	
5	1126	Cortran	2/25/09 11:20	2	0	0	0	0	5	0	2	Wachoria Day Care	1	1	Summit Ridge Rd	1	2	2	3	2	2	2	2	2	2	2	3	3	3	3	3	3	1	Saturday Service
5	1127	Cortran	2/25/09 15:30	2	0	0	4	0	5	0	2	Wm Fleming High school	1	1	Neil Dr	1	1	1	1	1	1	1	1	1	1	1	3	3	3	3	3	3	3	

On-Board Ridership Survey (Fixed Route Service) - Data Input Sheet
System Name: RADAR
Survey Date: 2/23/09 ~ 3/13/09
Note: "0" or "Blank" = No Response to question

			About You								About Your Trip Today					Service Characteristics Rating								Future Improvement Needs				Comment
System ID (01-06)	Serial Number (1001 or greater)	Route or Service Area	Boarding Time	Sex (1-2)	Age (1-6)	Race (1-4)	Education (1-4)	Household Income (1-6)	Ride Frequency of Demand-Response Service (1-5)	Ride Frequency of Fixed Route Service (1-5)	Trip Origin (Type 1-8)	Trip Origin (Place)	Destination (Type 1-8)	Destination (Place)	Ride Reason (1-7)	Reservation Procedures (1-6)	Bus On-time (1-6)	Hours (1-6)	Cost of bus fare(1-6)	Security (1-6)	Cleanliness (1-6)	Courtesy (1-6)	Overall Rating (1-6)	Less advance time (1-4)	Expand Hours/Days of Service (1-4)	Improve Serurity (1-4)	Other (1-4)	
5	1511	Henry County	2/24/09 6:25	1	5	1	2	3	2	3	0	Collinville Shopping ctr	1	803 Liberty St	1	6	2	3	1	2	2	2	2	4	1	3	1	Expanded Rt
5	1512	Henry County	2/24/09 8:00	1	2	4	2	2	2	3	2	Industrial Park	1	212 Fayette St	1	6	1	6	1	1	1	1	1	4	1	4	0	
5	1513	Henry County	2/24/09 7:10	2	1	1	2	1	2	3	8	Liberty Fair Mall	4	Walmart	2	6	1	6	1	1	1	1	1	4	1	4	0	
5	1514	Henry County	2/24/09 10:00	2	6	4	3	3	2	3	7	SS office	1	303 E. Church	4	6	1	1	1	1	1	1	0	4	1	4	0	
5	1515	City	2/24/09 10:45	2	4	2	2	4	2	3	7	City Hall	1	7 Booker Rd	2	6	1	6	1	1	1	1	1	4	1	3	1	Expanded Rt
5	1516	City	2/24/09 11:00	2	2	1	2	3	2	3	1	7 Booker Rd	4	Food Lion	1	6	1	1	1	1	1	1	1	4	1	1	0	Longer Route
5	1517	City	2/25/09 8:00	2	6	1	2	2	2	3	1	Spuce Village	5	Hospital	1	6	1	1	1	1	1	1	1	3	1	3	1	Expanded Route
5	1518	Henry County	2/25/09 9:00	2	5	1	3	4	2	3	4	Lowes	8	Lowes	7	6	1	6	1	1	1	1	1	4	1	3	1	Expanded Route
5	1519	Henry County	2/25/09 9:25	1	2	3	2	2	4	5	8	Collinville Shopping ctr	3	PHCC	2	6	1	6	1	1	1	1	1	4	1	3	1	Expanded Route
5	1520	City	2/25/09 14:00	2	4	2	3	3	0	5	1	7 Booker Rd	4	Walmart	1	6	1	1	1	1	1	1	1	4	1	3	1	Expanded Route
5	1521	Martinsville	2/25/09 14:10	2	5	1	3	1	3	4	4	Town	8	Town&Country	2	1	1	1	1	1	1	1	1	4	1	1	1	Expanded Route
5	1522	Henry County	2/25/09 13:15	2	6	2	2	2	2	3	4	Liberty Fair Mall	4	Walmart	3	6	1	1	1	1	1	1	1	4	1	3	0	Expanded Route
5	1523	Henry County	2/25/09 6:25	2	5	1	2	1	3	5	4	Collinville Shopping ctr	4	Walmart	1	1	1	1	1	1	1	1	1	0	1	0	0	
5	1524	Henry County	2/25/09 9:30	1	3	1	3	3	2	3	4	Walgreens	6	Jack Dalton Park	2	6	1	1	1	1	1	1	1	4	2	3	0	
5	1525	Martinsville	2/25/2009	1	4	2	3	0	4	5	8	City	3	County	1	0	1	1	1	1	1	1	1	0	2	0	0	
5	1526	Martinsville	2/25/2009	1	3	2	1	1	4	3	8		8	County	2	1	1	1	1	1	1	1	1	2	2	2	2	
5	1527	Martinsville	2/25/2009	1	3	0	2	0	4	5	6	City	3	County	1	0	1	1	1	1	1	1	1	0	1	1	0	
5	1528	Martinsville	2/25/09 7:48	1	5	1	4	1	2	3	8	W church St	4	Walmart	1	1	1	1	1	1	1	1	1	0	1	0	0	
5	1529			1	2	2	2	0	1	5	8	City	2	Town	1	1	1	1	1	1	1	1	1	0	1	1	1	
5	1530			2	6	2	2	1	0	1	8		4	Libery Fair Mall	3	1	0	0	0	0	0	1	0	0	0	0	0	
5	1531	City	2/25/09 14:00	2	6	2	1	3	2	1	8	Patrick Henry Mall	2	Libery Fair Mall	3	2	1	2	2	2	2	1	1	1	1	2	0	
5	1532	Martinsville	2/25/09 14:05	2	4	1	4	1	3	2	1	Spruce Village	8	Food Lion	2	6	1	3	2	1	1	1	2	4	2	4	1	Shorter travel time
5	1533	City	2/25/09 14:00	1	4	2	2	3	5	5	8	Patrick Henry Mall	2	Libery Fair Mall	1	1	1	1	1	1	1	1	1	1	1	1	0	
5	1534	Henry County	2/26/09 12:00	1	6	2	3	2	0	0	4	Walmart/Lowes	1	Lowes	1	0	1	0	1	1	1	1	1	1	2	2	0	
5	1535	Martinsville	2/24/09 13:30	2	6	2	3	5	2	3	5	Martinsville	1	Martinsville	3	6	1	6	1	1	1	1	1	4	1	4	1	More buses
5	1536	Martinsville	2/24/09 14:30	1	2	1	2	2	3	5	4	City	1	City	3	6	1	6	1	1	1	1	1	4	1	1	0	More buses
5	1537	Martinsville	2/26/09 14:20	2	5	2	3	5	2	3	7	Martinsville	4	Libery Fair Mall	4	6	1	1	1	1	1	1	1	4	1	3	1	shorter time between buses
5	1538	Martinsville	2/25/09 16:00	1	5	1	3	2	2	3	1	Martinsville	4	Martinsville	6	1	1	1	1	1	1	1	1	3	1	4	0	
5	1539	Henry County	2/24/09 7:30	2	4	2	2	3	2	1	8	Collinville Shopping ctr	4	Martinsville	3	6	1	6	1	1	1	1	1	4	1	4	0	
5	1540	Henry County	2/24/09 11:00	1	2	1	3	5	1	1	3	PHCC	1	Martinsville	2	6	1	6	1	1	1	1	1	4	1	4	1	More trips to PHCC
5	1541	Covington	2/23/2009	2	4	1	3	1	5	5	1		4	Walmart	1	1	1	1	1	1	1	1	1	2	1	3	0	
5	1542		2/26/2009	2	5	1	3	4	2	3	5	ARH	1		3	1	1	1	1	1	1	1	1	1	3	3	0	
5	1543	Irongate	2/25/09 12:45	1	5	2	2	0	2	3	2	LowMoor VA	1	Covington	1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1544	Mountain Express	2/24/09 8:38	2	6	4	1	1	5	0	1	Clifton Forge	4	Covington	1	0	2	0	1	1	1	1	0	0	0	0	0	
5	1545	Mountain Express	2/24/09 8:58	1	6	1	1	1	5	5	1		4		1	0	0	0	2	0	0	0	0	0	2	0	0	
5	1546	Mountain Express	2/24/09 9:40	2	6	2	2	1	5	0	1		8		1	1	0	0	0	0	0	1	0	0	0	0	0	
5	1547	Mountain Express	2/24/09 9:50	2	6	1	1	1	4	5	1		4		1	1	1	1	1	1	1	1	1	0	1	0	0	
5	1548	Mountain Express	2/24/09 10:15	1	6	1	0	4	5	5	8		1	67 Greenboro	1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1549	Mountain Express	2/24/09 10:32	1	0	2	3	1	4	5	5		5		2	3	3	0	3	0	3	2	2	0	1	0	0	
5	1550	Mountain Express	2/24/09 10:45	2	6	1	1	2	5	1	8	Riverside	8		1	1	1	2	1	2	1	1	1	1	0	0	0	
5	1551	Mountain Express	2/24/09 12:30	1	1	2	2	1	5	5	3	AHS	8	Covington	1	1	1	1	1	1	1	1	1	2	1	3	1	more buses
5	1552	Mountain Express	2/24/09 14:50	1	6	2	3	1	4	5	1	Food Lion	1	Covington	2	0	2	2	2	2	2	2	2	0	1	0	0	
5	1553	Mountain Express	2/24/09 14:15	0	6	2	2	0	4	5	8		5	Hospital	1	2	2	2	2	2	1	2	2	2	2	2	2	Trip to Roanoke
5	1554	Mountain Express	2/24/09 14:38	2	1	1	1	1	4	5	1	Mountain View	2	Covington	1	1	2	2	1	1	1	1	1	1	1	2	0	
5	1555	Mountain Express	2/24/09 14:55	2	6	1	1	1	0	5	5	Clifton Forge	4		1	1	1	1	1	1	1	1	1	2	2	2	2	
5	1556	Mountain Express	2/24/09 15:15	2	6	1	1	2	5	1	8	Hospital	1	Covington	1	1	2	1	1	1	1	1	2	1	0	0	0	
5	1557	Covington	2/25/09 9:15	2	6	2	2	0	5	4	1	Alleghany Ave	2	Madison Ave	1	1	0	0	0	0	0	0	0	1	0	0	0	
5	1558	Covington	2/25/09 9:20	2	6	2	1	1	5	4	4		4		1	1	2	2	1	1	3	2	1	1	1	1	1	Trips to Roanoke

5	1559			1	3	1	3	2	2	3	1	Clifton Forge	1	Cifton Forge	3	1	1	1	1	1	1	1	1	2	1	1	0	
5	1560			2	5	1	2	1	4	1	8	Clifton Forge	4	Clifton Forge	1	1	1	1	1	1	1	1	1	3	2	2	4	
5	1561			2	2	3	2	2	5	0	1	Clifton Forge	2	Covington	3	3	4	4	0	1	1	1	2	0	1	0	0	
5	1562			1	5	3	1	1	5	5	1		8		1	2	2	2	1	1	1	1	1	2	2	2	2	
5	1563			1	6	4	1	1	5	5	1		4		1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1564		2/25/2009	1	6	4	1	1	5	5	1		4		1	1	1	1	1	1	1	1	1	2	2	2	2	
5	1565			2	4	3	2	4	4	4	1		6		1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1566			2	3	2	2	2	5	5	2		1		1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1567		2/25/2009	2	5	3	2	5	5	5	1		4		1	2	2	2	2	1	1	1	1	2	2	2	2	
5	1568		2/25/09 8:40	2	6	4	1	1	5	0	1	Clifton Forge	4		1	0	1	0	1	0	1	1	1	0	0	0	0	
5	1569		2/25/2009	0	2	0	2	6	3	0	2		0		1	6	0	0	0	0	0	0	0	3	0	0	0	
5	1570		2/25/2009	2	5	0	2	1	5	0	8		6	Town	1	1	0	0	0	0	0	0	0	2	0	0	0	
5	1571			2	1	1	1	1	4	0	1	Clifton Forge	2	Covington	1	1	2	1	1	1	1	1	1	1	1	2	0	
5	1572			2	3	0	1	1	3	4	1	Clifton Forge	4	Covington	1	1	1	1	1	1	1	1	1	1	1	2	0	
5	1573			2	6	2	2	1	4	0	2		2		1	0	0	0	0	0	0	0	0	0	0	0	0	
5	1574		2/25/2009	1	6	3	1	5	1	2	4	Covington	1	Covington	1	3	3	3	3	3	3	1	3	4	3	3	4	
5	1575		2/25/2009	2	5	4	4	6	3	0	1	LowMoor VA	5		1	3	3	3	1	3	1	1	3	2	1	1	1	
5	1576		2/24/09 9:23	1	1	2	4	1	5	5	3	Clifton Forge	8		3	1	1	1	1	1	1	1	1	1	1	1	1	
5	1577		2/24/2009	2	0	4	3	5	3	5	6		7		6	6	6	6	6	6	1	1	1	3	2	1	0	
5	1578			2	1	1	4	2	4	4	8		8		7	5	5	5	5	5	1	5	5	1	1	1	1	
5	1579			2	3	1	4	6	5	5	6		4		3	1	1	1	1	1	1	1	1	1	1	1	1	
5	1580			1	2	3	3	6	4	5	1		5		3	1	1	1	1	1	1	1	1	1	1	1	1	
5	1581		2/25/09 13:13	1	3	2	1	5	2	3	8		8		6	3	3	3	3	3	3	3	3	2	2	2	2	
5	1582		2/26/2009	1	5	4	2	1	1	2	5		7		6	1	1	1	1	1	1	1	1	1	1	1	1	
5	1583		2/25/2009	2	4	2	3	5	5	5	1		2		1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1584		2/25/2009	1	4	1	3	1	5	5	2		6		1	2	2	2	2	2	1	1	1	2	2	2	2	
5	1585		2/23/2009	2	3	1	3	1	5	5	1		2		1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1586	Covington	2/26/2009	1	5	1	3	0	3	3	5		1	Covington	4	1	1	1	1	1	1	1	1	3	2	4	0	
5	1587			2	6	1	1	5	3	4	1	Alleghany Ave	5	Low Moor	2	0	1	3	1	1	1	1	1	0	2	0	0	
5	1588			1	4	2	3	4	4	5	1	Covington	6	Low Moor	2	0	2	2	1	2	2	2	2	0	2	3	0	
5	1589			1	3	2	4	6	2	5	1	Covington	3	Clifton Forge	5	0	1	1	1	1	1	1	0	0	2	2	0	
5	1590			2	6	1	2	5	5	5	2	LowMoor VA	1	Covington	2	0	1	2	1	1	1	1	1	0	1	1	0	
5	1591			2	1	1	2	1	1	2	4	Walmart	1	Covington	1	1	1	1	1	1	1	1	1	2	1	1	0	
5	1592		2/26/2009	2	2	0	2	0	4	5	1	Clifton Forge	5	Low Moor	1	2	2	2	2	2	2	2	2	2	1	3	0	
5	1593		2/26/2009	2	4	2	2	0	4	5	1	Covington	1	Covington	1	3	3	3	1	4	4	4	4	0	1	0	0	
5	1594		2/26/2009	2	5	2	1	0	2	4	1	Selma	5	Low Moor	1	2	2	2	2	2	2	2	2	0	2	0	0	
5	1595		2/26/2009	1	3	0	2	0	4	5	3	Selma	1	Covington	1	3	2	3	1	2	2	2	2	0	1	0	0	
5	1596			1	6	4	2	3	3	4	5	Clifton Forge	1	Clifton Forge	0	1	1	1	1	1	1	1	1	1	1	1	1	
5	1597			2	6	4	1	6	5	0	1	Clifton Forge	4	Covington	1	0	1	0	1	0	0	1	0	0	0	0	0	
5	1598			2	6	1	3	2	3	1	1	Clifton Forge	5	Hospital	1	2	1	1	1	1	1	1	1	0	1	0	0	
5	1599			0	5	0	2	2	3	4	1		3		1	0	6	0	0	0	0	0	0	0	4	0	0	
5	1600			1	1	2	2	1	5	5	1	Dairy Queen	3	AHS	1	1	1	1	1	1	1	1	1	1	1	3	4	
5	1601			1	1	2	1	1	1	5	1	LowMoor VA	3	Covington	1	1	3	3	1	1	1	1	1	2	1	3	0	
5	1602			1	3	1	2	2	5	5	5	Hospital	2	Covington	1	1	1	1	1	1	1	1	1	0	1	0	0	
5	1603			2	6	1	2	1	3	5	1	Covington	8	Covington	1	0	1	0	1	1	1	1	1	0	0	0	0	
5	1604			1	2	1	2	4	1	1	8	Covington	8	Clifton Forge	1	1	1	2	1	1	1	1	1	2	1	3	1	More pick ups during the day
5	1605		2/26/2009	2	6	3	1	0	4	5	5	Allrghany	1	Iron Gate	1	2	2	2	3	3	3	2	2	0	0	0	0	
5	1606			2	4	1	2	0	4	5	4	Covington	1	Iron Gate	1	2	2	2	2	2	2	2	2	0	1	0	0	
5	1607			1	1	1	2	0	4	5	3	Dabney	1	Covington	1	2	2	2	2	2	2	2	2	0	1	0	0	
5	1608			2	1	1	2	1	4	5	1	Clifton Forge	2	Covington	1	1	2	1	1	1	1	1	1	1	1	2	0	
5	1609			2	1	1	1	1	4	5	1	Clifton Forge	2		1	1	2	1	1	1	1	1	1	1	1	2	0	
5	1610			2	1	1	1	1	4	5	1	Clifton Forge	2	Covington	1	1	2	1	1	1	1	1	1	1	1	2	0	
5	1611			2	1	1	1	1	4	5	1	Clifton Forge	2	Covington	1	1	1	1	1	1	1	1	1	1	1	2	0	
5	1612			2	1	1	1	1	4	5	1	Clifton Forge	2	Covington	1	1	1	1	1	1	1	1	1	1	1	1	1	
5	1613			1	4	1	1	0	4	5	1	Clifton Forge	4	Covington	1	2	2	2	2	2	2	2	2	2	1	0	0	
5	1614		2/26/2009	2	0	1	2	0	4	5	4	Walmart	1	Clifton Forge	1	2	2	2	2	2	2	2	2	1	0	0	0	
5	1615	Covington	2/26/2009	1	6	1	1	0	4	5	1	Clifton Forge	4	Walmart	2	2	3	2	1	1	1	1	1	2	1	3	0	
5	1616		2/26/09 8:40	2	6	4	1	1	5	1	1	Clifton Forge	4	Covington	1	0	2	0	1	1	1	1	1	0	0	0	0	This suits me
5	1618		2/26/2009	2	4	1	2	2	5	4	4	Walmart	1		1	1	1	1	1	1	1	1	1	2	3	3	0	
5	1617			1	6	2	2	0	4	4	8		5	Hospital	1	0	2	0	2	2	1	2	2	0	1	0	0	Trips to roanoke
5	1619			2	3	0	2	1	4	5	2		2		2	0	0	0	2	0	2	0	0	0	0	1	0	
5	1620			2	6	1	1	1	4	5	1	Covington	4	Covington	1	1	1	1	1	1	1	1	1	0	1	0	0	
5	1621			0	5	1	2	1	5	5	1	Covington	5	Kmart	2	1	1	1	1	1	1	1	1	0	1	0	0	
5	1622			0	4	3	1	1	5	5	1	Riverside	4	Covington	1	1	1	1	1	1	1	1	1	0	1	0	0	
5	1623			1	3	2	1	1	5	5	1	Lexington Ave	2	Covington	1	1	1	1	1	1	1	1	1	0	1	0	0	
5	1624			2	1	2	1	1	5	5	7	Alleghany Ave	5	Covington	2	1	1	1	1	1	1	1	1	0	1	0	0	
5	1625			2	2	1	1	2	5	5	1	Craig st	3	Covington	2	1	1	1	1	1	1	1	1	0	1	0	0	
5	1626			2	4	2	2	2	5	0	1	Mallow	5	Low Moor	2	1	1	1	1	1	1	1	1	0	0	1	0	
5	1627			2	5	4	1	2	5	5	1	Alleghany Ave	4	Clifton Forge	2	1	1	1	1	1	1	1	1	0	1	0	0	
5	1628		2/26/2009	2	6	1	0	1	4	5	1		4		1	1	1	1	1	1	1	1	1	0	0	0	0	
5	1629			1	2	1	3	2	5	5	3	Covington	3	Covington	2	1	1	1	1	1	1	1	1	3	1	3	3	
5	1630		2/26/2009	2	6	2	1	0	5	4	2		2		7	1	1	1	1	1	1	1	1	2	2	3	0	
5	1631	Covington	2/27/06 15:35	2	6	2	3	0	4	0	4		0	Walmart	1	0	1	0	1	1	1	1	1	1	0	0	0	
5	1632			1	2	2	2	2	2	3	1		4		5	3	2	3	1	0	2	1	1	4	1	2	0	

5	1633	Covington	2/27/09 8:15	2	6	1	3	3	1	2	1	Covington	4	Covington	1	3	2	6	0	2	2	2	2	3	2	1	0		
5	1634			1	2	2	2	1	2	3	4		1		1	3	3	3	3	3	3	3	3	0	0	0	0		
5	1635			1	3	1	2	1	2	3	1		5		3	2	3	1	2	2	1	2	2	2	2	1	2		
5	1636		2/25/2009	0	5	1	3	2	1	2	2	Covington	4	Covington	2	6	1	6	1	1	1	1	1	1	3	4	0		
5	1637		2/25/2009	2	4	1	2	2	2	3	8	Covington	1	Covington	1	6	1	6	1	1	1	1	1	1	2	2	0		
5	1638		2/25/2009	2	3	2	2	2	2	3	7	Covington	1	Covington	1	6	1	6	1	1	1	1	1	1	3	2	0		
5	1639		2/25/2009	2	6	1	2	2	5	4	4		1		1	3	2	2	1	2	1	1	0	2	1	2	0		
5	1640		2/25/2009	2	6	1	2	2	5	4	4	Walmart	1	Scott-Hill	1	3	2	2	1	2	1	1	0	2	1	2	0		
5	1641	Mountain Express	2/25/09 11:15	1	1	2	1	1	5	3	5	ARH	1	Clifton Forge	1	6	1	6	1	1	1	1	1	2	2	2	0		
5	1642	Covington	2/25/09 9:23	0	6	2	2	0	5	4	8	Town	5	County	1	0	2	0	2	2	2	2	2	0	0	0	0	Trips to Roanoke	
5	1643	Covington	2/25/09 9:25	0	6	2	2	2	4	5	1	Town	4	County	3	1	2	2	1	1	1	1	1	0	0	0	0	Trips to Roanoke	
5	1644	Covington	2/25/09 9:30	2	5	2	2	1	1	2	1	Alleghany Ave	5	Low Moor	2	1	1	1	1	1	1	1	1	4	4	4	4		
5	1645	Covington	2/25/09 9:00	1	2	1	3	2	5	5	8		3	Clifton Forge	1	1	1	1	1	1	1	1	1	3	2	3	3		
5	1646	Covington	2/25/09 9:12	2	6	0	2	0	5	4	2	Alleghany Ave	2	Madison Ave	1	1	1	1	1	1	1	1	1	1	0	0	0		
5	1648	County	2/25/09 9:45	2	6	4	1	0	2	5	2		2		1	1	1	1	1	1	1	1	1	0	0	0	0	Trips to Roanoke	
5	1649	Covington	2/25/09 10:15	1	4	1	2	2	2	3	1	Clifton Forge	8	Covington	1	2	1	2	1	2	2	2	2	2	2	2	2		
5	1650	Clifton Forge	2/25/09 10:30	2	5	1	4	1	5	4	8	Alleghany Ave	3	Covington	6	2	3	3	1	1	1	1	2	2	1	2	0		
5	1651	Covington	2/25/09 11:20	2	6	2	1	1	5	4	1	Shopping Ctr	4	Walmart	1	2	2	2	1	1	1	0	0	1	0	0	0	Trips to roanoke	
5	1652	Covington	2/25/09 11:30	0	6	4	1	1	5	0	8	Covington	1	Clifton Forge	1	0	1	0	1	0	1	1	1	2	2	2	2		
5	1653	Covington	2/25/09 11:43	1	6	0	1	1	5	5	1	Clifton Forge	4	Covington	1	1	2	1	0	1	1	1	1	3	2	3	0	Trips to Roanoke	
5	1654	Covington	2/25/09 12:10	2	4	1	3	1	4	5	4	Covington	8	Clifton Forge	1	6	2	3	1	1	1	1	2	2	1	2	0		
5	1655	Covington	2/25/09 12:10	2	1	1	1	1	3	5	4	Covington	8		1	6	2	2	1	1	1	1	2	2	1	2	0		
5	1656	County	2/25/09 12:30	2	5	4	3	2	4	5	5	Clifton Forge	4	Covington	1	1	0	0	0	0	0	0	0	4	0	0	0		
5	1657	County	2/25/09 12:50	1	3	2	2	1	4	3	1	County	5	Clifton Forge	1	1	1	1	1	1	2	1	1	3	3	3	3		
5	1658	County	2/25/09 14:10	1	2	4	1	0	4	0	1	Selma	5	Covington	6	2	3	2	1	1	1	1	1	3	2	3	3		
5	1659	County	2/25/09 14:15	2	5	2	1	2	4	5	2	Work	4		1	1	1	2	0	1	2	1	1	1	1	1	0		
5	1660	County	2/25/09 14:20	1	6	2	2	2	4	1	5	Valley Ridge	1	Covington	1	2	2	2	1	1	1	1	1	3	3	3	0		
5	1661	County	2/25/09 14:25	0	6	0	1	1	2	3	0		1		3	2	2	6	1	1	2	1	1	3	3	3	0		
5	1662	Covington	2/25/09 14:35	2	4	2	2	1	3	1	1	Alleghany Ave	4	Covington	1	2	2	2	1	1	1	1	2	2	3	3	0		
5	1663	Covington	2/25/09 14:40	2	3	1	3	2	2	1	7	Town	1	C Wood Apts	1	3	2	3	1	1	2	1	2	3	3	3	0		
5	1664	Covington	2/25/09 15:05	2	5	1	2	0	4	5	1	Covington	1	Alleghany	1	2	1	1	1	1	1	1	1	4	1	2	0		
5	1665		2/26/2009	2	1	1	1	1	4	5	4	Covington	1	Clifton Forge	1	1	2	1	1	1	1	1	1	1	1	2	0		
5	1666		2/26/2009	2	3	1	1	1	3	4	4	Covington	1	Clifton Forge	1	1	1	1	1	1	1	1	1	1	1	1	1		
5	1667		2/26/2009	2	5	1	3	3	1	3	4	Walmart	1		2	1	1	1	1	1	1	1	1	3	2	3	0		
5	1668		2/26/2009	1	2	1	3	1	3	5	3	LowMoor VA	1	Covington	2	1	1	1	1	1	1	1	1	3	3	3	1		
5	1669		2/26/2009	1	6	2	1	1	3	5	0		4	Clifton Forge	1	1	1	1	1	1	1	1	1	0	0	0	0		
5	1670		2/26/2009	2	5	0	1	1	2	4	5	Alleghany Ave	8	County	1	2	2	2	2	2	2	2	1	1	1	2	0		
5	1671		2/26/2009	0	6	4	1	1	5	0	1	City	8		1	0	1	0	1	0	1	1	0	0	0	0	0		
5	1672		2/26/2009	2	5	1	4	1	5	4	8	Clifton Forge	3	Alleghany	1	2	1	1	1	1	1	1	1	0	1	0	1	More runs a day	
5	1673		2/26/2009	2	6	1	3	2	3	5	4	Covington	1	Clifton Forge	1	1	1	1	1	1	1	1	1	0	1	0	0		
5	1674		2/26/2009	1	6	1	1	2	4	5	1		4		1	1	1	1	1	1	1	1	1	1	0	0	0		
5	1675		2/26/2009	2	5	1	3	4	4	2	1		5	county	5	1	2	2	1	1	1	1	1	2	2	1	0		
5	1682		2/26/2009	1	4	1	3	4	4	4	2	Work	4		2	1	1	1	1	1	1	1	1	0	0	3	0		
5	1683		2/26/2009	1	2	3	3	3	2	3	1	Home	0		2	1	1	1	1	1	1	1	1	2	0	0	0		
5	1684		2/26/2009	1	3	1	3	3	3	5	5	Covington	1	Valleyridge	1	1	1	1	1	1	1	1	1	3	3	3	3		
5	1685		2/26/2009	2	4	3	1	1	4	5	6	YMCA	1	Covington	5	1	1	1	1	1	1	1	1	3	3	3	0		
5	1686		2/26/2009	1	3	1	2	2	2	3	1	Covington	2	Low Moor	4	1	1	1	1	1	1	1	1	3	3	0	3		
5	1687		2/26/2009	2	0	1	2	3	5	3	1	Jackson st	6	YMCA	2	1	2	1	1	1	1	1	1	2	2	2	2		
5	1688		2/26/2009	2	5	1	2	3	2	2	2		1		5	1	1	1	1	1	1	1	1	1	1	1	1		
5	1689		2/26/2009	2	4	2	2	2	2	4	2		4		6	1	1	1	1	1	1	1	1	1	0	0	0		
5	1690	Covington	2/24/09 13:15	1	4	0	2	2	4	5	4	Covington	1	Covington	5	2	2	2	1	2	2	2	2	0	0	0	0		
5	1711	Covington	2/25/09 12:11	2	2	1	2	1	3	5	4	Covington	8	Clifton Forge	1	6	2	1	1	1	1	1	1	2	1	2	0		
5	1712			2	5	2	3	1	4	1	8	Covington	1	Alleghany	1	2	2	2	1	2	2	1	1	3	2	2	0		
5	1694	Roanoke College	3/13/09 17:00	2	1	1	3	6	3	4	3	Roanoke College	4	Roanoke, VA	1	3	4	5	6	3	3	3	3	2	1	2	0		
5	1695	Roanoke College	3/13/09 17:00	2	1	1	3	0	3	0	3	Roanoke College	4	Valley View Mall	1	0	1	2	1	1	1	1	0	3	3	0			
5	1696	Roanoke College	3/13/09 17:00	2	1	1	3	0	2	1	3	Roanoke College	1	Valley View Mall	1	6	2	6	1	2	2	2	2	3	2	2	0		
5	1697	Roanoke College	3/13/09 17:00	2	2	1	3	1	2	0	3	Salem, VA	8	Center of the Square	2	6	1	2	1	3	2	2	2	4	1	2	0		
5	1698	Roanoke College	3/13/09 17:00	2	2	1	4	1	2	4	3	Roanoke College	8	Roanoke, VA	1	0	2	3	1	1	1	2	2	0	1	1	0		
5	1699	Roanoke College	3/13/09 18:00	2	2	4	2	1	3	5	3	Salem, VA	8	Roanoke, VA	1	1	3	3	1	1	1	1	1	1	1	1	0		
5	1700	Roanoke College	3/13/09 18:00	2	1	4	2	2	2	3	3	Roanoke College	8	Roanoke, VA	1	1	1	1	1	1	1	1	1	4	1	4	0		
5	1701	Roanoke College	3/13/09 18:00	2	1	3	2	4	3	2	3	Roanoke College	6	Roanoke, VA	1	6	1	1	1	2	1	1	1	4	2	1	0		
5	1704	Roanoke College	3/13/09 19:00	1	1	4	3	2	2	2	3	Roanoke College	3	Elirabeth Campus-Roanoke College	1	2	3	2	3	0	1	2	1	1	2	2	0		
5	1726	Hollins Express	2/27/09 18:00	2	1	1	3	0	2	0	3	WILLIAMSON Rd	4	Valley View	1	1	1	2	2	1	2	1	1	1	1	1	0		
5	1727	Hollins Express	2/27/09 18:00	2	2	2	4	0	3	0	3	Hollins University	4	Valley View	1	2	2	3	1	1	1	2	2	2	1	2	0		
5	1728	Hollins Express	2/27/09 18:00	2	1	1	3	6	4	0	3	Hollins University	4	Valley View	1	0	2	0	0	2	2	1	2	0	0	0	0		
5	1729	Hollins Express	2/27/09 18:00	2	2	2	3	2	2	0	4	Hollins University	0		2	2	2	1	6	1	1	1	2	4	3	3	0		
5	1730	Hollins Express	2/27/09 18:00	2	1	1	3	1	4	0	3	Hollins University	4	Roanoke VA	1	2	2	2	1	1	1	1	1	4	2	4	0		
5	1731	Hollins Express	2/27/09 18:00	2	1	1	2	0	2	0	3	Hollins University	8	Roanoke VA	1	6	1	2	1	1	1	1	1	4	2	4	0		
5	1732	Hollins Express	2/27/09 18:00	2	2	1	3	2	2	3	3	Hollins University	4	Valley View	1	6	2	6	2	2	2	2	2	4	2	4	0		
5	1733	Hollins Express	2/27/09 18:00	2	2	4	4	0	2	0	3	Hollins University	4	Valley View	1	3	4	3	1	6	3	3	3	2	1	2	0		
5	1734	Hollins Express	2/27/09 8:00	2	1	2	3	1	1	0	3	Hollins University	4	Valley View	7	3	3	3	3	3	3	3	3	2	2	2	1		
5	1735	Hollins Express	2/27/09 8:03	2	1	2	3	4	1	0	3	Hollins University	4	Valley View	1	6	1	3	1	1	1	1	0	1	1	1	0		
5	1736	Hollins Express	2/27/09 7:04	2	2	1	3	1	4	1	3	Hollins University	4	Valley View	1	6	2	6	6	2	2	3	2	4	4	4	0		
5	1737	Hollins Express	2/27/09 7:04	2	2	1	3	3	4	1	3	Hollins University	4	Valley View	1	0	3	6	0	1	1	2	2	0	1	3	1	flexible about keeping schedule	

5	1738	Hollins Express	2/27/09 6:26	2	2	1	3	1	1	2	2	Valleyview Blvd	3	Williamson Rd	1	2	1	1	1	1	1	2	1	1	1	2	0	
5	1739	Hollins Express	2/27/09 7:04	2	2	1	3	4	3	3	3	Roanoke	4	Roanoke VA	1	6	2	2	2	2	2	1	2	2	1	2	0	
5	1740	Hollins Express	2/27/09 8:03	2	2	2	3	2	1	0	3	Hollins University	4	Valley View	3	6	2	1	1	1	1	1	1	4	2	1	0	
5	1741	Hollins Express	2/27/09 9:01	2	2	4	2	2	3	0	3	Roanoke	4	Valley View	1	1	2	1	6	1	1	1	1	1	1	1	0	
5	1742	Hollins Express	2/27/09 9:20	2	1	1	3	5	2	1	2	Valleyview Mall	3	Hollins University	1	6	2	3	1	1	1	1	2	4	4	4	4	
5	1743	Hollins Express	2/27/09 9:30	2	2	1	3	4	2	3	6	Roanoke	6	Valley View	3	6	1	1	1	1	1	1	1	4	1	2	2	
5	1744	Hollins Express	2/27/09 8:30	2	2	4	3	2	0	3	4	Roanoke	4	Valley View	2	6	2	6	6	1	2	2	2	1	1	4	1	Expand the Holllins route
5	1745	Hollins Express	2/28/09 12:57	2	1	0	3	0	3	0	3	Hollins University	4	Valley View	1	3	2	3	1	1	2	2	2	3	2	3	0	
5	1746	Hollins Express	2/28/09 13:00	2	1	2	3	1	2	3	3	Hollins University	4	Valley View	1	0	1	6	6	6	3	3	1	1	1	1	0	
5	1747	Hollins Express	2/28/09 13:00	2	2	4	2	6	2	3	3	Hollins University	8	Valley View	1	3	3	3	3	3	3	3	3	4	4	0	4	
5	1748	Hollins Express	2/28/09 13:00	2	2	4	2	6	2	4	4	Hollins University	4	Roanoke VA	1	2	3	2	2	1	2	2	2	2	2	1	0	
5	1749	Hollins Express	2/27/09 1:25	2	2	4	3	4	2	3	3	Hollins University	4	Walmart	1	6	3	2	6	2	1	3	2	4	2	2	0	
5	1750	Hollins Express	2/27/09 13:25	2	2	1	3	4	2	1	3	Hollins University	4	Valley View	1	6	3	6	6	2	1	1	2	4	4	4	0	
5	1751	Hollins Express	2/28/2009	2	2	4	3	0	1	1	3	Hollins University	4	Valley View	1	6	6	6	6	6	6	6	6	0	1	0	1	More locations/stops
5	1752	Hollins Express	2/28/09 14:00	2	2	0	3	6	3	2	3	Roanoke	4	Valley View	1	2	2	2	2	2	2	2	2	2	2	2	0	
5	1753	Hollins Express	2/28/09 14:00	2	1	4	3	0	1	1	3	Hollins University	4	Valley View	1	6	6	6	6	6	6	6	6	4	1	4	4	
5	1754	Hollins Express	2/28/09 14:00	2	1	3	3	1	2	3	3	Hollins University	4	Valley View	1	2	3	2	2	2	2	2	2	2	2	2	0	
5	1755	Hollins Express	2/28/09 14:00	2	2	4	3	3	4	4	3	Hollins University	4	Valley View	1	6	4	6	6	2	2	5	3	4	4	4	0	
5	1756	Hollins Express	2/28/09 14:20	2	1	1	3	0	3	5	3	Hollins University	4	Valley View	1	0	2	3	0	2	1	2	2	0	0	0	2	more stops
5	1757	Hollins Express	2/28/09 14:30	2	1	1	3	3	3	1	3	Hollins University	4	Valley View	2	6	3	6	6	3	3	3	3	4	1	2	0	
5	1758	Hollins Express	2/28/09 14:20	2	1	1	3	5	2	3	3	Hollins University	4	Roanoke VA	1	2	3	3	1	2	2	1	2	2	2	1	3	
5	1759	Hollins Express	2/28/09 18:00	2	1	1	2	4	2	1	3	Hollins University	4	Valley View	4	3	3	3	3	3	3	3	2	3	3	3	4	
5	1760	Hollins Express	2/28/09 14:20	2	1	1	3	0	2	1	3	Hollins University	4	Valley View	1	6	2	6	6	2	2	2	2	4	1	3	0	
5	1761	Hollins Express	2/28/09 15:00	2	2	4	2	2	3	1	3	Hollins University	4	Valley View	1	6	1	2	6	1	1	1	1	4	2	3	0	
5	1762	Hollins Express	2/28/09 15:25	2	2	1	4	2	3	1	3	Hollins University	4	Roanoke VA	1	1	1	1	1	1	1	1	1	2	1	2	0	
5	1763	Hollins Express	2/28/09 16:00	2	1	1	3	0	2	3	3	Roanoke	4	Valley View	1	0	2	0	1	2	2	1	2	0	1	3	0	
5	1764	Hollins Express	2/28/09 16:00	2	2	1	3	5	1	1	3	Hollins University	3	Hollins University	1	6	2	3	1	1	1	1	1	4	2	2	0	
5	1765	Hollins Express	2/28/09 17:00	2	1	3	3	2	3	3	3	Roanoke	4	Roanoke Mall	1	6	1	1	6	1	2	1	1	3	2	3	0	
5	1693	Ferrum Express	2/28/09 19:00	1	2	2	2	6	4	4	3		8		1	1	2	1	1	1	1	1	1	4	1	3	0	
5	1835	Ferrum Express	3/13/09 5:50	1	1	1	3	6	2	4	3	Ferrum College	4	Rocky Mount, VA	5	6	1	6	1	1	1	1	1	4	1	2	0	
5	1836	Ferrum Express	3/13/09 5:55	2	1	1	3	6	2	3	3	Ferrum College	4	Rocky Mount, VA	1	6	1	6	1	1	1	1	1	4	2	2	0	
5	1837	Ferrum Express		1	1	2	2	1	4	4	4	Roanoke	6	Roanoke	1	1	1	1	1	1	1	1	1	2	2	2	0	

Project Initiation Meeting Minutes
RADAR

Roanoke, VA
January 13, 2009

The project kickoff meeting with RADAR took place on Tuesday, January 13th at the RADAR offices in Roanoke, VA. The meeting began at approximately 9:00 AM. A copy of the meeting agenda is attached at the end of these meeting notes.

Attendees

Attendee	Organization
Curtis Andrews	RADAR
Jim Atkins	RADAR
John D. Desper	RADAR
Leon D. Robertson	RADAR
Jerry Caldwell	RADAR
Lewis Grimm	PBS&J
James Boyer	PBS&J
Amy Inman	DRPT (by phone)

Meeting Notes

Following self introductions, Amy Inman (DRPT) gave a short presentation on the TDP process that is being applied to all transit agencies in the Commonwealth. She outlined the plan by which all systems will need to have an adopted TDP in place by 2011 in order to be eligible to receive Federal and State transit capital and operating assistance grants. DRPT is committed to assisting all of the public transit agencies in Virginia of all sizes with the process of developing a TDP, which describes each agency's plans over the next 5-7 years. Amy noted that the PBS&J Team is engaged in assisting a group of 10 transit agencies with the TDP process.

Lewis Grimm (PBS&J) then presented a brief overview of the TDP process with a review of the general project scope of work and schedule that will be followed in the preparation of the TDP for RADAR and the other nine transit systems around the state. He noted that while the same general process and a similar TDP report outline will be applied to all 10 systems, it is acknowledged that each system is different and that the contents of each report will vary from system to system. He noted that the primary purpose of today's meeting is to interact with the

key transit management staff and obtain an initial understanding of the history and operations of the system. Subsequent meetings will discuss the evaluation of the system, potential service modifications, and an outline of the plan for how the system might evolve over the next 5-10 years.

Curtis Andrews (RADAR) then presented an overview of the current RADAR operations. He noted that RADAR had recently participated in a DRPT performance review and that he was looking forward to receipt of the final report in the near future. While RADAR is a designated public transportation service provider, it also provides contract services to about 30-40 separate agencies in the greater Roanoke area. Approximately 43 percent of the service is demand-responsive / dial-a-ride type operations, with other fixed-route/fixed-schedule and deviated fixed-route service and specialized agency transportation services. A summary of current operations by ridership on each is as follows:

- STAR (Valley Metro paratransit) – 34% of total ridership
- CORE Transit (Roanoke County) – 8%
- Deviated Fixed Route (Metro Express) – 9%
- Maroon Express Fixed Route – 1%
- Hollins Express – 3%
- Ferrum Express – 1 ½%
- Martinsville Area (deviated fixed route) – New service, no data at this time

No system origin-destination surveys have been conducted; surveys of satisfaction with service and related topics are regularly conducted with the various agencies that RADAR has contracts with. Total system operations were about 1.0 million vehicles miles of service in 2008. The majority of this service is provided in the more rural areas of the region.

RADAR has prepared a 6-year vehicle replacement program which it attempts to follow as funding permits. The total fleet includes 10 Valley Metro purchased vehicles used for the local paratransit service. The fleet also includes 10 TAP / Head Start school buses that are used for the transportation of student participants in these programs.

Other RADAR operations include home service group, JARC, and New Freedom. No surveys have been conducted of riders who use these services. Estimated usage of 800-900 per day maximum on these services.

All but the TAP buses have on-board GPS systems. All vehicles have 2-way radios. Computerized scheduling is used where possible with the Route Match software. On-board cameras are installed on 2 vehicles at the present time; this is being expanded as required and as new vehicles are being acquired.

STAR service operates primarily in the cities of Roanoke, Salem, and Vinton. City residents cannot be transported into surrounding areas of Roanoke County. The CORTRAN system

operated under contract with Roanoke County allows County residents to travel into the City of Roanoke. Both the STAR and CORTRAN services have defined fares while no boarding fares are charged to users of the various human service agencies contracted services.

When asked about newly implemented or planned services, Curtis noted the following:

- Covington / Clifton Forge – service began in 1996 with only 12 pasengers per month. Today the service transports 1100-1200 passengers each month with two vehicles. One of the drivers has transported as many as 100 passegners per day on his vehicle. Service has doubled since October 2008 to accommodate growing demand.

- DAR – have added 50 clients since November 2008 on CORTRAN; annual growth rate of 5-6% in recent years.

- Martinsville service began on January 5th as a DRPT demonstration project.

- Lexington / Buena Vista has been identified by DRPT as a potential new future service area.

- Alta Vista – DRPT is currently assessing potential for new service in this area.

- Smith Mountain Lake – has been identified as a potential new service area due to growing on-site, year round residences and desire for transport to and from shopping areas in West Lake area. Just initial discussions with community to date.

- Bedford – another potential new service area based on initial discussions with community officials.

- Craig County – no study yet but some local interest has been expressed.

In response to a question, Curtis indicated that he does not foresee any major operational issues at this time; fuel costs seem to have become much more stable in the past few months. He did express some concerns about long term state and local budget stability to be able to support the current operations and pay for expansions in the future. Ridership data is provided to city and county staff and the county boards of supervisors on a regular basis.

The current RADAR fleet totals 55 vehicles, and the existing facility has a parking area sufficient to accommodate a total of about 95 vehicles. There is also additional land adjacent to the current property that could be acquired if needed to accommodate future system growth. Curtis commented that the initiation of new services in locations such as Lexington / Buena Vista further away from Roanoke might require the establishment of satellite operations facilities. This is not needed at the present time since there are only 1-2 vehicles in the Covington/Clifton Forge area (stored overnight at Allegheny Regional Hospital) and Martinsville (stored overnight at the City public works facility).

All RADAR vehicles are currently maintained on-site at the main Roanoke facility, a relatively new facility in operation for less than 10 years. There are currently two full-time mechanics assigned to vehicle maintenance. One new vehicle was received last week and will be used as a spare for the Martinsville and Clifton Forge operations.

Vehicle fueling is currently provided at the local Quarles fueling site in Roanoke. RADAR is investigating a potential on-site bulk fueling system to ensure long term adequate fuel capacity for the system. The Covington/Clifton Forge operations are fueled locally in that area, with the Martinsville bus fueled at the City of Martinsville public works facility. Valley Metro fuels their STAR vehicles at the Valley Metro facility at a cost of only $1.00 per gallon to RADAR. Curtis and his staff estimated that monthly fuel usage by the RADAR system is about 9,000 gallons each month, with this being a mix of gasoline and diesel fuel. All new vehicles being purchased are gasoline powered.

All of the current RADAR drivers are part-time employees. Though not required of all drivers by the system, those drivers who possess a CDL are provided with a $600 annual bonus and earn an additional $0.75 per hour on their base wage. The CDL is only required for those drivers assigned to the school bus vehicles and other vehicles which transport more than 20 passengers. There is a conscious effort to keep the size of the vehicles in the fleet at or below 16 passengers, with most of the newer vehicles being 14 passengers plus the driver. In response to a question, Curtis indicated that no system capacity issues have been observed; routing and scheduling options appear to have avoided this problem.

On the public services, no passenger loading problems have been observed. The provision of additional stops and route structure adjustments have effectively resulted in more buses and a net increase in the number of passenger seats and drivers.

Jerry Caldwell (RADAR Director of Maintenance) commented that the system has all necessary equipment to service the current vehicle fleet. They dug a well on site to obtain water to allow the regular washing of vehicles due to limited nearby water system options. They also reuse old oil to heat the garage area. They also maintain a covered vehicle inspection area.

The system Route Match and Mentor systems have recently been upgraded. One noted need was for additional computer work stations for use by the system dispatching and scheduling personnel.

In response to a question, some interest was expressed in the desire for passenger waiting benches or shelters across the entire service area. Martinsville was noted as a particular area of interest. All of the time points noted on schedules are defined and treated as “bus stops” although not all of these are believed to be formally marked.

The meeting was adjourned at approximately 11:00 AM.

PROJECT INITIATION MEETING AGENDA

RADAR
Roanoke, Virginia

January 13, 2009

9:00 AM

1. Introduction of Attendees

2. Overview of Transit Development Program (TDP) Process

3. Review of Project Scope of Work Elements

4. Information Exchange

    a. Transit system service and operating characteristics and history
    b. Service area demographic and travel characteristics
    c. Transit agency interaction with other public and private organizations

5. Project Specific Issues, Concerns, and Desired Outcomes

6. Next Steps in Study Process

7. Potential Next Meeting Date(s)

8. Adjourn